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THE PAPER TRADE JOURNAL.

"The Consumption of Paper is the Measure of a People's Culture."

VOLUME XXV.—NO. 10. NEW YORK, MARCH 7, 1896. WHOLE NUMBER 1140.

Trade Topics.

Wood Pulp Grinder.

The accompanying illustration shows an improvement in wood pulp grinders which has for its object the provision of means whereby the feeding of the wood to the reducing device is effected automatically and continuously, and whereby the speed at which the wood is fed to the reducing device can be regulated whenever desired in accordance with the speed of the reducing device, without thereby interrupting the operation of reduction or the operation of the feed mechanism.

Figure 1 is a sectional elevation and Fig. 2 a plan view of the portion of the machine sufficient to illustrate the invention.

A indicates the driving shaft, on which is secured a grinding disk, A^1. This shaft is driven in any manner from a suitable prime motor, and *c* is the casing for the grinding disk, on which casing are formed or secured the feed boxes F B, the feeding device consisting of a piston, F P, whose rod, Q, is guided in a suitable opening in the top of the feed box.

The piston rod Q is constructed in the form of a rack bar, and carries a collar, Z, adjustable lengthwise by means of a set screw, said collar being provided with a tappet or finger, *z*, adapted to engage the free end of a shifting lever, Y, fulcrumed to a bracket arm, *a*, on the top of the feed box F B. The forked end X of the lever Y engages a clutch coupling, O', revolving with and having endwise motion against the stress of a spring, S^2, on a shaft, P, which has its bearings in the bracket arm *a* and in a standard, *a'*; also on the top of the feed box F B. The shaft P carries a pinion, P', in gear with the teeth on the piston rod Q and a bevel pinion, O, provided with a clutch face, *o*, adapted to be engaged by the clutch O', the pinion being loose on the shaft P and in gear with a corresponding pinion, N, on a shaft, M, having its bearings in suitable brackets formed in the adjacent feed boxes, and carrying a worm wheel, L, and constituting the driving shaft for the piston rods Q of two contiguous feed boxes, the shaft M carrying, of course, two pinions, N, fast thereon.

When the shaft M is revolved in the proper direction the pistons F P will be moved toward the grinding disk A^1, and when these pistons have moved a given distance in that direction, determined by the adjustment of the collar Z, the tappet or finger *z* thereon will engage the free end of the lever Y, thereby moving the forked end X thereof outwardly, and with it the clutch O' and uncoupling pinion O from shaft P, which may then be revolved in a reverse direction by means of the hand wheel A'. When a piston is moved in a direction the reverse of its feed motion, as described, the tappet *z* will move out of contact with the shifting lever, thereby enabling the spring S^2 to move the clutch O' into engagement with the clutch face of pinion O.

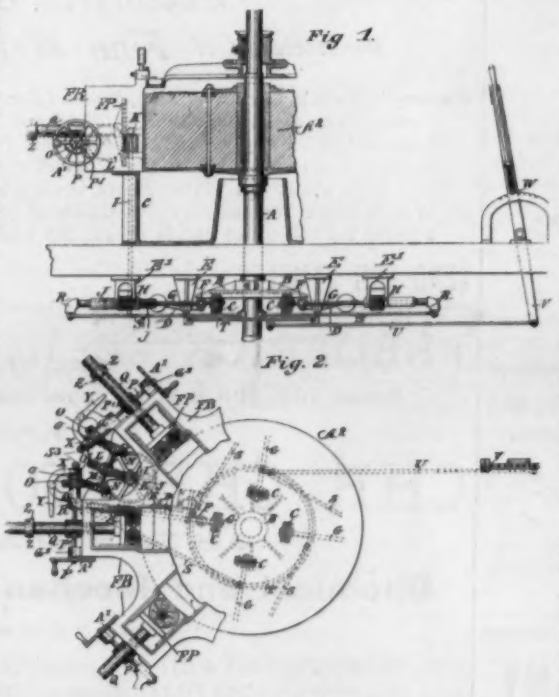
Although two pistons are caused to move synchronously and at the same speed, yet the distance which they move in the feed boxes in one direction is determined independently of each other, and their motion in that direction is stopped either synchronously or independently or at different periods. This is necessary in view of the fact that the thickness of the blocks of wood or the diameter of the logs introduced into the feed boxes varies considerably, so that one piston will reach the limit of its motion toward the grinding disk sooner than another, and unless the motion of the piston is stopped it would come itself into contact with the disk, which would result in damage to both.

The speed changing mechanism through which continuous motion is imparted to the shafts M and the speed of the grinding disk is regulated is preferably arranged below the floor which supports the grinding apparatus, so as to be out of the way.

To the shaft A for the grinding disk A^1 is secured a friction disk, B, and from hangers, E E, is supported a ring, T, concentric with shaft A, and connected by the rod U with one arm of an adjusting lever, V, fulcrumed on the floor *f* and having a spring tooth adapted to engage a toothed segment, so that when the lever is shifted along the segment in one or the other direction the ring T will be correspondingly revolved on the foot of the hangers. To each of the hangers E is fulcrumed a weighted lever, D, and to the free end thereof is pivoted a bearing sleeve, F, for a horizontal shaft, G, there being as many such shafts as there are pairs of feed boxes, F B, about the grinding disk A^1, the shafts being further supported in bearings formed in the legs of forked hangers, E', between the fork of which the shafts carry a worm, H. The worm H is connected with its shaft G by groove and feather so as to admit of endwise motion, and the worm is in gear with a worm wheel, J, Fig. 2, at the foot of a vertical spindle, I, which carries at its upper end a worm, K, in gear with the worm wheel L on the shaft M.

At their inner end the shafts G carry a friction wheel, G, held in contact with the disk B by a weighted lever, D, while the outer end of the shaft revolves in a coupling, R, connected with the adjusting ring by means of a connecting rod, S.

When the ring T is revolved, as described, in one or the other direction, the shafts or spindles G are moved inwardly or outwardly or toward or from the axis of rotation of the friction disk B, and consequently of that of the grinding disk A^1. Should the wood therefore not be fed with sufficient speed, by properly shifting the lever V the shafts G can be moved outwardly or from the axis of rotation of the disk B, thereby increasing the speed of rotation of the friction wheels C in proportion to the distance to which they are so moved, such increased speed being communicated to the feed pistons F P through the mechanism described. It will therefore be seen that by the manipulation of a single lever the speed of a number of feed pistons can be varied as circumstances may require, and that the motion of the pistons is derived directly from the shaft of the grinding disk.



WOOD PULP GRINDER.

Sulphite Fibre Manufacture—XX.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

BY SANFORD E. THOMPSON.

Less thought is apt to be bestowed upon the construction of the sand settlers than they really deserve. When properly constructed they will remove all of the pieces of knots and large shives so as to reduce the work of the screens very materially.

In determining the size and length of the sand settlers it should be borne in mind that their object is not merely to serve for a run of one day, but that their capacity must be sufficient to provide for a run of several days, or, better, for at least a week. As sand settlers will begin to fill at the upper end and the refuse matter gradually extends toward the lower end, the capacity is determined by the height of the riffler boards and the length and width of the troughing. For a capacity of 20 or 30 tons for twenty-four hours, a width of 8 feet and a depth of 2 feet is none too great, while the length should be as long as the space which can be utilized will allow.

One matter of great importance is the location of the sand settlers in such a position that they can be readily got at to clean. It is a great convenience to have them supported entirely from below, so that there may be no posts or rods above the sides of the troughing to interfere with convenient use of hose and scraper. The hose for flushing out should be conveniently located, and the drain spouts should be frequent enough to shorten as much as possible the length of time required for cleaning up.

Where the drain spout is of wood there is a simple construction for gate which when carefully made will always be tight and easy to operate. A square hole, the size of the spout, is cut in the bottom of the troughing, and a gate, consisting of a board slightly larger than the opening and cleated, or otherwise arranged so that it will not warp, is cut. This gate runs between two cleats screwed to the bottom of the trough and rabbeted so as to prevent any tendency of the gate to get out of place. The cleats are twice the length of the gate, so as to hold it when it is shut and when it is open. We have by this construction simply a board in the bottom of the troughing, arranged so that it will completely close the opening or slide and leave the opening entirely clear for the stock to flow through. The pressure of the water on top of it prevents it from leaking. To operate this gate a staple or eyebolt is fastened to its under side and an iron rod is connected with this staple or eye. This rod runs horizontally through a hole cut for it in one side of the spout and extends as far as is convenient for operating. To the end is attached a simple wooden lever of such length that it may be readily worked by hand.

Care should be taken in building the supports for sand settlers to see that they are sufficiently strong to prevent any sagging or springing of the boards or supports to cause leakage. Where a weight consisting of iron or wood is to be supported it is easy to judge of the size of the supports needed. Water, however, is more deceptive. It must be remembered that water weighs 62½ pounds per cubic foot. For a trough 8 feet wide containing 18 inches depth of water there will therefore be a weight per lineal foot of 750 pounds, and the distance apart of the supports should be calculated by the ordinary rules of mechanics. For troughing 24 inches deep the bottom should be made of 2 inch stock and the sides of 1½ inch stock.

For sand settlers and troughing lumber partly dried or nearly green is better than kiln dried, and white pine is as good a material as can be found. Sand settlers will leak if they are allowed to stand without water, no matter how carefully they are jointed and leaded; but water and stock running through them will quickly close up the joints.

Where the particles to be removed are coarse, such as pieces of knots and large shives, the riffler boards may be 12 inches high and about 2 feet apart. It makes practically no difference whether they are vertical or placed on a slant. If slanting, however, they should slant down stream. The stock will gradually collect below the boards, that is, on the downstream face, and fill up between them, beginning, as has already been stated, with the rifflers near the upper end of the sand settlers and gradually extending down toward the lower end. It may be that before it is time to clean up the refuse will be level with the top of the boards at the upper end.

For collecting fine particles of dirt narrow riffle boards are better than wide. One construction which has been found to work well is a narrow vertical board with a horizontal board fastened to the top of it and extending down stream. A kind of an eddy will be formed under the board, and dirt will collect. The writer at one time made a series of experiments to determine the best construction for rifflers. It was found, as stated above, that for coarse matter simple vertical boards work as satisfactorily as any. To catch fine particles, such as black specks of rotten wood or bark, boards placed horizontally so that the stock will flow above and below them, and covered with felt, were found to collect the largest amount of dirt. A dam may be placed at the lower end of the sand settlers so as to raise the water nearly to the top of the troughing, and then a series of boards, perhaps for convenience 3 feet in width and the same length as the width of the troughing, may be placed one above another, say 3 inches apart, and the stock allowed to flow between them. By having a large number of these tiers of boards a great amount of dirt may be taken out. Some experimenting is necessary when constructing these boards to see that the current is of that speed and uniform enough to prevent thick stock from collecting between the board and filling up the spaces. If everything is properly arranged the stock will flow free and only dirt will collect on the felt. Felt with a good nap is best to use, but even if the felt is worn the particles of fibre will collect on it and form a kind of nap. The boards must be placed in slides, so that they may be readily removed. The dirt is easily washed off from the felt with the hose.

Whatever style of riffler boards is used the velocity of the current is of great importance. Ordinarily a speed of about 40 feet per minute is best. This is slower than it is customary to run; but with most kinds of stock good stuff will not settle at this speed. When we consider that from practical experiments made in the carrying power of rivers and streams it has been found that the weight of material which a stream will carry varies as the sixth power of the velocity, it will be seen that a very slight difference in speed will greatly affect the amount of dirt and sediment which will be deposited. Of course the object of sand settlers is, as far as possible, to deposit all dirt and hard matter and to float all good stock. The speed of the current is regulated by a dam at the lower end of each section. A smooth, even flow is very essential, for if there are side currents or many angles to be turned the dirt will not settle nearly so well.

Sand settlers should not be cleaned any oftener than is really necessary, since after every clean-up there is always a run of dirty stock, no matter how carefully everything is washed out. They should be examined, however, every day to see that they are not so full as to allow dirt to run past them. Some cookings will give three or four times as much stuff for deposit as others.

Mortgages to Secure Future Advances.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

The idea of giving security in advance for credits is of very early origin in the commercial transactions of men. The principle of retaining the thing pledged or mortgaged, not only until the payment of the specific debt created at the time of the transaction, but until all subsequent indebtedness was canceled, is distinctly recognized in the Roman civil law.

Contracts for future advances are sometimes made part of the security given for their payment, and in such cases the mortgages are the same, to all intents, as if the consideration for the indebtedness had been paid at the time the contract for their payment was given. No future incumbrance upon the estate can interpose, so as to postpone the security of the first mortgage, and the mortgagee may make the advances stipulated even after notice of a later mortgage. It seems to be requisite that such contract to make future advances to enable the mortgagee to continue making them, after an intervening incumbrance, should form a constituent part of the original contract, and bind both parties, the one to make and the other to accept such advances; but it is not requisite that it should all be expressed in one instrument.

The most important class of mortgages to secure future advances is where the advances are contemplated at the time of giving the security, and expected by both parties to be made, provided there is no change of circumstances or of credit; but where nevertheless it is optional with both parties to put an end to the dealings at any moment, sometimes by definite notice to that effect, and sometimes by simple refusal to continue the dealings. The numerous class of cases of dealings with banks and bankers, and guarantors and indorsers, and the like, where extensive and hazardous credits are constantly given, from day to day and hour to hour, where it is just and equitable that security should be given, to cover future transactions, are of great interest to business, and especially commercial, men, and they are not entirely free from difficulty.

Where there is no binding contract on the part of the mortgagee the whole matter rests merely in negotiation, and continues optional with both parties until the advances are made. The security therefore has no binding force, and no vitality or validity, until they are made. The debtor therefore has the election whether he will accept them or not, and there can be no obligation on his part that he will not negotiate with other parties upon a further credit upon his estate. He must do this if the first mortgagee refuses the advances, and he may do so if for any reason he desires to transfer his account elsewhere. If he makes this election there can be no wrong in a party to whom he applies to make such further advances upon the credit of the mortgagor's remaining interest in the estate. The application is a virtual election to nullify the optional portion of the first mortgage as to further advances.

After this has been done, and the estate, in good faith, is pledged to a subsequent mortgagee, and this is known to the first mortgagee, it can be nothing short of bad faith for him to allow a further credit to the mortgagor, if he does it with the purpose of compelling payment out of the estate, at the expense of the second mortgagee. As a general rule, it has been considered that the registry of the second mortgage will only be notice of its contents to future purchasers and incumbrancers, and not to prior incumbrancers, thus oper-

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ating forward, and not backward. A requirement that one should, after taking a mortgage, constantly watch the registry, or act at his peril, would tend to render such continuing security of little avail, but according to the decisions of the courts of some of the States the registry is full notice to the first mortgagee not to make further advances under his mortgages.

The general view of the American courts, and the uniform declaration of the English courts, so far as we know, is that nothing short of notice in fact will have the effect of postponing such further advances by the first mortgagee to the lien of the second. It is expressed under various forms of language, but the result of the whole is that if the first mortgagee has full knowledge of the existence of a second mortgage upon the estate he cannot give further credit upon his prior mortgage, provided it is entirely optional with him whether to make further advances or not. This has often been declared by judges and text writers, and may now be regarded as settled law, notwithstanding an occasional case seems to require something more.

It seems now perfectly well settled that a mortgage, to secure further advances, may be in the form of a gross sum expressed on the face of the instrument as a present indebtedness. This, however, must be a constituent part of the original agreement, or simultaneous agreements, both of record, and in probably the latest case on the subject (Fuller *v.* Griffith, 60 N. W. Rep. 247), where a conveyance was made to secure a debt, and the grantees subsequently made advances to the grantor, the Supreme Court of Ohio held that, in the absence of an agreement the conveyance should also stand as security for the advances, they could not be "tacked" as against judgment creditors of the creditor; and it has been held not competent to keep the security on foot, and apply it to other indebtedness, by virtue of a parol contract to that effect.

Correspondence.

MIAMI VALLEY.

[FROM OUR REGULAR CORRESPONDENT.]

DAYTON, Ohio, March 3, 1896.

It cannot be said that business is positively good, nor is it persistently bad. Yet there is no happy medium to refer to. It is a sort of puzzle.

Within a month trade will brighten considerably. Many branches are already preparing for the spring rush, notably the paper novelty concerns.

A brief telegram last week indicated that suits in attachment had been brought against the Friend-Stebbins Manufacturing Company by New York and Detroit banks. The message was necessarily curtailed and contained little of an explanatory character. In short, developments were not at hand at the time and were not forthcoming until late Saturday evening. As it was, the mere chronicling of the fact that suits had been entered may have wrought some injustice to the defendant firm.

On Thursday night suits were filed by five financial concerns, viz.: The Commercial National Bank, of Detroit ($6,500); German National Bank, of Covington, Ky. ($2,000); Hide and Leather National Bank, of New York ($3,000); States Savings Bank, of Detroit, Mich. ($6,000); Luther Holland and DeWitt G. Holland, New York ($2,500), upon notes given to E. C. Hargrave & Co., of New York. The First National Bank of Miamisburg was garnisheed, papers being served at once upon the officers of that institution. The sheriff succeeded in attaching about $99,000 worth of bonds in the possession of the bank, as the property of the Friend-Stebbins Company, and held as collateral for claims amounting to $56,000.

In answers filed to a number of the suits, the Friend-Stebbins Company said that the paper sued upon was accommodation paper, and that it received no benefit whatever therefrom. In the motions filed later the attorneys for the defendant company appeared before Judge Elliott and said that statements made by the various parties to whom attachments had been allowed were untrue. Stock certificates to substantiate their statements were shown, and it was clearly proven that the corporation was not founded under the laws of Illinois.

The motions were heard and a prompt decision followed, in which the court found that the allegations were not true.

Attachments previously issued were discharged at the cost of the plaintiffs, which the latter excepted. The peculiar turn of affairs was unlooked for by the plaintiffs. It is now merely a matter as to which will win in the courts, as the cases will be tried on their merits. The sheriff has released all property.

The total amount of the suits in attachment was $20,000, while suits aggregating about $15,000 were brought previously, upon which no attachments were sought or issued.

The Friend-Stebbins Manufacturing Company is located at West Carrollton, and is the owner of patents for the manufacture of sulphite fibre machinery, paper pulp digesters and paper mill machinery. E. C. Hargrave & Co. manufacture paper pulp at Hinckley, N. Y., and have officesin New York.

It is stated upon good authority that the Friend-Stebbins Manufacturing Company is in no serious way involved. The financial muddle does not directly or indirectly invovle the J. H. Friend Paper Company, at West Carrollton.

Judge Elliott on Monday of this week rendered his decision in the motion of creditors of the W. W. White Paper Company to remove Receivers O. M. Gottschall and H. H. Hoffman. It was short, spicy and decisive, and, in a nutshell, defended the receivers, as the motion was dismissed. This will afford Messrs. Gottschall and Hoffman an opportunity for clearing business rapidly. A lengthy dissertation on the subject was anticipated, inasmuch as several days were consumed in the legal examination, but the judge caused a little stir by a simple verbal reference. It was a quick disposal of a weighty matter. However, it seems to have taken the judge three weeks to have fully determined. The result was generally expected.

The receivers report that the assets of the company are $265,819.62 and liabilities $406,041.37. This information was developed by due process of law, one of the alert stockholders bringing suit in order to obtain it.

An application has been filed to sell the property. The original appraisement of the plant was $109,807.06, while that of stock and materials on hand is $53,103.13. The plaintiffs, J. A. Kauffman and others, claim that the receivers have been carrying on the business since their appointment and that they will have certain orders for tablets and printing supplies within thirty days, and that to continue the manufacture of tablets after that time would result in a material loss. They therefore seek an order from the court to sell the property. There is a belief that the order will be granted, and this may partly account for the retention of the receivers, as an early sale will result.

In the case of Levi Spitler against Thos. B. Reynolds, secretary-treasurer, the Columbia Insurance Company sets up a claim of $11,000 on three promissory notes secured by mortgages on building lots. The Columbia company asks that its interests be protected.

The total liabilities of the Eagle Paper Company of Franklin are $18,936.25, and the assets $105,265.99. It is gratifying to note a generous increase of assets, which more than illustrates that the late failure was precipitated by a sudden combination of circumstances, aided materially by the hard times, and that a halt was called at exactly the right time.

President D. B. Anderson has submitted the following as a statement of assets and liabilities, as shown by the inventory and appraisement, and the schedule of debts and liabilities, filed by the assignee in the courts of Warren County.

ASSETS.

Real estate—	
Paper mill property (Lots Nos. 679, 680, 681 and 682, Franklin, Ohio)	$60,000.00
Pulp mill property (Lot No. 975, Franklin, Ohio)	14,000.00
Lot No. 601, Franklin, Ohio (pumps and wells located thereon)	2,100.00
Lot No. 974, Franklin, Ohio, vacant	1,800.00
Lots in Mackinaw addition to Franklin, Ohio (50, 51, 52 and 153)	450.00
Personal property—	
Cash	1,220.73
Bills receivable	117.45
Accounts receivable	6,667.64
Manufactured paper	16,179.48
Paper stock and chemicals	1,612.29
Office furniture and fixtures	154 25
Miscellaneous personal property	904.20
Total appraised value of assets	$105,265.99

LIABILITIES.

Mortgage bonds	$23,700.00
Mortgage bonds (in question)	2,300.00
Bills payable (assignor primarily liable)	31,680.46
Bills payable (assignor liable as indorser)	7,377.29
Bills payable (liability in doubt)	5,435.27
Accounts payable	11,843.23
Total liabilities	$81,936.25
Excess of assets over liabilities as per appraisement	23,329.74

It will be recalled that the case of the Lockland Bank against C. F. Gunckel and others appeared in the courts in this valley on exceptions to the findings of Referee H. H. Haines in an action brought to assess the stockholders of the defunct Middletown Paper Company.

Another rumbling of that big disaster came late last week when Judge Giffen announced his decisions. Substantially, the court held, first, that the Merchants' National Bank had been the holder of $45,000 worth of stock of the paper company and is yet liable to pay its share of any debts unpaid at the hour of the failure incurred while it owned the stock and found this to be $107. In this he supported the referee. The court upheld the finding of the referee, in that the note for $10,400 paid by the Middletown Paper Company to the Merchants' Bank and secured by mortgage on Mr. Gunckel's real estate was the debt of the latter, who was only an indorser.

The court found with the referee that the preferred stockholders must also pay the double liability, notwithstanding the contract with the paper company indorsed on their certificates, wherein the paper company had agreed to buy back the stock at par at the end of three years, if the holder desired to sell; overruled the finding of the referee as to the liability of the partners to pay any difference between the actual value of the plant owned by the partnership in 1883 and the price fixed by them when they sold it to the corporation. The court held that this difference was $23,387, and that the partners should pay this sum to the receivers under this ruling.

It is stated that Mr. Sorg will necessarily pay $4,049, Mr. Bana, of Cincinnati, $4,000, and Mr. Bar about $2,000.

Notice of appeal was given and the case will likely go to the Circuit Court.

William Hooper has resigned as superintendent of the Tytus-Gardner Paper Company, with which he has been associated for a year. William O'Brien is now acting superintendent.

Representatives of the Urbana Straw Board Company and Ohio Straw Board Company, of Urbana, were arraigned under the indictment of the recent grand jury at Springfield last week and fined $150 and costs each for fouling and poisoning a public stream of water. Pleas of guilty were entered. M. V.

GREAT BRITAIN.

[FROM OUR REGULAR CORRESPONDENT.]

LONDON OFFICE PAPER TRADE JOURNAL, 1 Mitre Court, Fleet St., E. C., LONDON, February 22, 1896.

In my last I mentioned that a meeting was to take place at the offices of Henderson, Craig & Co. with a view of forming a British Wood Pulp Association. This step has been in contemplation for some time. With the rapid growth of the industry a good many causes of friction have arisen, and the combined action of the trade is necessary to smooth them down. Everybody interested in wood pulp has felt this for some time, and the meeting passed off without hitch. In addition to the conveners the leading men in all the principal firms were present.

Mr. Henderson, who was voted into the chair, was also able to read a large number of letters from provincial wood pulp firms unable to send representatives, but strongly sup orting the movement. The Kellner-Partington Company, among others, pointed out the fact that there were many matters which could not be dealt with by individual action and only possible of advantageous solution by means of a strong and well-knit association. In fact, the opinion of the principal firms as expressed in these letters seems to be unanimous on the point, and among the matters awaiting discussion and settlement were noted the eternal question of the percentage of moisture allowable in wood pulp, the form of contract to be used by the trade, and the question of arbitration in matters of dispute. The high rates charged by the Manchester Ship Canal were also mentioned as a sore place which needed association ointment.

Walter Craig then brought the proceedings into perfect order by putting a definite proposal before the meeting. He suggested the appointment of a committee to draft a scheme with the view of submitting it to a representative meeting to be called at a later date. He touched lightly upon the various rough places which the association could smooth away, and suggested that it should work under the style of the British Wood Pulp Association.

Mr. Andrews, of Christopherson, Anderson & Co., in seconding this proposal, believed that with unanimity the association would be of the greatest service to the trade. He seemed to think that arbitration was one of the most important matters with which the association would be called to deal.

W. G. Taylor believed that the association could formulate a binding contract to which sellers of pulp could adhere. He thought that it was an important matter that there should be one recognized contract form and one alone.

Mr. Becker, of Becker & Co., wished to cut the Gordian knot of the moisture difficulty by ordaining that pulp should be sold on a bone-dry basis, at which suggestion there was just the ghost of a smile on several faces.

As for the Manchester Ship Canal, the principal irritation seems to be want of uniformity in price, and the fact that importers are mulcted in certain fines for causes outside of their control, such, for instance, as the absence of the trucks necessary to unship cargoes.

The meeting was unanimous, and the entire absence of friction or serious difference of opinion argues well for the future of the British Wood Pulp Association, a title which was adopted *nem. con.*

The provisional committee appointed consists of Messrs. Craig, Andrews, Taylor and M. G. Skramnes, all well-known men in the trade. It is doubtful if anybody of importance will remain outside of the association. Reporters for the press were invited to be present, and moreover were admitted when they did arrive, which is a healthy sign.

The Paper Makers' Association made a mistake of the very largest size when, on its first meeting under the new régime, it shut its doors to the representatives of the paper trade journals, whom it had previously invited to attend.

Marchant, Singer & Co. have been so good as to send me a copy of their very excellent Directory of Paper Makers. This contains a painstaking and accurate list of all of the mills, arranged in so many ways that whether your information stops short at the name of the owner, the name of the mill, its number or its location, it is equally easy to put your finger on it at once and find out all else you may want to know. It starts off with an alphabetical list of owners, arranged under the heads of England and Wales, Scotland, Ireland, and the Isle of Man. Lists of the paper makers' London representatives and London wholesale stationers follow. Then come three more full lists of mills, *i. e.*, according to number, an alphabetical list of the names of the mills, and lastly alphabetically arranged according to location under the respective counties. A classification of makes, with makers' names, and an excellent list of trade designations used as watermarks by paper makers and wholesale stationers completes the work. Its accuracy is highly creditable to the publishers, and it is sent free by post anywhere for the small sum of 1s. 4½d.

The last stage of all in the seven ages of a paper mill was reached a week or so ago at the Woking Paper Mills, when the machinery, &c., was sold up piecemeal. The prices reached in some cases were fairly good, but a 72 inch Fourdrinier machine was knocked down for $1,775.

I note also that the Kevock Paper Mill, Lasswade, may come to the same melancholy fate next week. It will be started in one lot at an upset price of $15,000, but if this is not reached the plant will be sold piecemeal. It has a paper making machine capable of making 40 tons of high-class paper; all of the necessary preparative plant for dealing with esparto, a presse pâte, super and friction glazing calenders, and there are seventeen steam engines of various types about the place. It is a melancholy thing to see an old mill like this retiring from the fight.

Talking about sales by auction, there was a curious one in the principal auction rooms in the city a week or so ago. Six patents, any one of which the inventor believed was

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calculated to revolutionize the paper trade, were put up to public bidding. There was a solitary bid of $50, and the auctioneer pretended to treat it as a joke. However, his taunts could not sting the crowd into further bidding, and, as the sale was without reserve, the hammer fell; the solitary bidder pulled out his £10 note, and the parchments were handed over to him. He then informed the auctioneer that the patents were originally purchased by a company for $600,000, whereupon the crowd and the auctioneer in chorus sang: "Oh, why didn't you tell us that before?"

How well a small, well managed paper mill may succeed is shown by the annual report just issued of the Bath Paper Mills Company, Limited, a concern which Thomas Owen, of Cardiff, licked into shape, and of which, if I mistake not, he is yet a director. This company has quite a small mill, known as the Trevarno Paper Mills, and the one machine of 54 inches turns out a great variety of papers, from colored printings to imitation parchments. The profits for the whole of last year amounted to $6,800, not a huge amount, it is true, but highly satisfactory, considering the small amount of capital necessary to work such a concern. In addition to this there was a balance in hand which brought the amount available for distribution up to $8,750, and considerably less than half of this was sufficient to pay a dividend of 10 per cent. to the shareholders.

Michael McKenzie, the senior partner of the Govanhaugh Paper Company, Pollokshaws, has had possibly a unique experience for a paper maker. He was brought before the bailie at the Pollokshaws police court, and accused of having allowed the mill to be occupied and worked from the 2d of January to the 6th without a certificate that it was fit for occupation. The fact is that there was a fire at the mill some time ago and it does not seem to have been properly rebuilt. At any rate Mr. McKenzie pleaded guilty, stating in mitigation, however, that the builder thought the place was safe. This, of course, has been the opinion of builders from time immemorial, but the bailie exacted a fine of something less than $25, which is not much to pay for a paper making contravention of the laws of the land.

The Ramsbottom Paper Mill Company, Limited, has passed a resolution to reconstruct itself, and, accordingly, is winding up for the purpose. The new company has been registered with a capital of $720,000 in 54,000 preference shares of $5, and 18,000 ordinary shares of $25. Edward Partington leads the list of subscribers to the memorandum of association, and will be chairman of the company as before.

It is noticeable in the Board of Trade returns for the month of January that whereas, with the single exception of Germany, the amount of paper imported into England from all countries mentioned in the list has increased, the imports from the Fatherland have decreased by nearly $15,000 as compared with the same month of last year. The shipping business in paper was evidently brisk in January. Exports to the United States and to Canada showed a slight decrease, but there was an increase in exports to all other countries, Australia figuring especially well in the list.

The paper makers of the North, who, in particular, have to mind their p's and q's in the matter of river pollution, are just enjoying their annual prosecution. Both the Sun and the Star mills are suffering partial eclipse; but from their statements they seem likely to get well through their troubles and shine brighter than ever. Darwen, which is on a mere trickle which should feel proud when it is called a brook, is also under a cloud. Pretty nearly all of the mills are being worried by the inspectors.

The will of Phillip Cadell Peebles (Peebles & Son), of Rishton and White Ash Paper Mills, both in Lancashire, has been proved. The personal estate amounts to about $800,000.

I am concerned to find that my pen wrote Christie in place of Brodie as the makers of the abnormally wide wire for the Clyde machine. I had expressed my contrition to the Messrs. Bertrams before I heard from the Messrs. Brodie, who wrote me with exceeding promptitude. However, the slip was purely accidental, and James Brodie & Co., of the Great Eastern Wire Works, Glasgow, are the parties who secured the contract for the wires of the big Clyde machine, and who laid down the loom capable of weaving machine wires up to 174 inches broad. ALFA.

HOLYOKE.

[FROM OUR REGULAR CORRESPONDENT.]

HOLYOKE, Mass., March 5, 1896.

The chief topic of interest in this vicinity this week has been the big spring freshet, followed by high winds since Monday.

The usually sober and well behaved Connecticut River started out on Monday to beat its record of last year, and it well nigh succeeded, coming within 1 inch of last year's high water mark at the Holyoke dam.

The weather began to get in its work on Saturday, when it started in to rain early and kept up all day and night, and well into the following Sunday.

The river was quick to respond, and it was rising all day Tuesday and Wednesday, until it finally registered 10 feet and 1 inch at the headgates.

Of course the water has occasioned more or less damage and inconvenience, and the ice, which began to break up on Sunday, added greatly to the danger. The basements of a number of mills have been flooded, and some stock has been damaged. The mills have been obliged to lose considerable time because of the flood.

Our northern and western neighbors have also been troubled more or less by high water. Several bridges have been carried away, and some buildings have been damaged by the raging waters. The railroads have also suffered, because of numerous washouts.

The Fall Mountain Paper Company, at Bellows Falls, had a number of piers, which had recently been built on the White River to hold the booms, washed away. A part of the Fairfield Paper Company's dam across the Westfield River was also carried away. At Dalton the basement of the Crane mills was flooded, and some stock was damaged. The Springdale Paper Company, at West Springfield, had a quantity of paper ruined by the water, which poured into the basement of the mill.

The mills have been considerably troubled yesterday and to-day by anchor ice. The breaking up of the ice in the river filled the canals with floating particles, and men were kept busy removing the ice from the gratings so that the machinery could be kept running. Among those having the greatest amount of trouble were the Massasoit, Wauregan, Connecticut River and George R. Dickinson paper companies. The water has gone down nearly 4 feet since Wednesday afternoon.

Congressman Gillette presented the case of those interested in the opening of the Connecticut River to navigation before the Committee on Rivers and Harbors yesterday, and made a very strong case. His argument was listened to with considerable attention, and the committee had many questions to ask. It is thought, however, by those who understand the situation that the committee will hardly advise an appropriation for this purpose during the present session of Congress. The best that can be hoped for just now is the ordering of a new survey.

The fire department responded to a call from the Franklin Paper Mill yesterday morning, but the company's fire apparatus had nearly put out the blaze before the arrival of the city department. A workman in the machine room who was making some repairs overturned a lighted lamp, and this set fire to the oily floor. Prompt action on the part of the employees resulted in putting out the fire before any serious damage was done.

The addition to the Crocker Manufacturing Company's mill, which has been under way for nearly two years, is fast approaching completion, and it will be ready for occupancy by May 1. The new machinery, which will include three new paper machines, is being put in quite rapidly.

Annie M. Short, who for many years was a faithful employee of the Massasoit Paper Manufacturing Company, died at Baltimore this week, where she had been taken for the benefit of her health. The body was brought to this city for burial.

One of the cases before the present term of the Superior Court will be a suit by the Holyoke Savings Bank for judgment on a note given by B. F. Hosford, of the defunct Winona Paper Company. The Holyoke Water Power Company also sues its former agent, W. A. Chase, for $10 000, for the use of land on Dwight street for five years.

The *Daily Democrat* will appear this evening as a full-fledged eight page newspaper, with six columns to a page.

J. Marras, who has been superintendent of the Mt. Tom Pulp Mill since it was built, will soon leave for Austria, his native land, for the benefit of his health.

A. W. Esleeck, treasurer of the Beebe & Holbrook Paper Company, is critically ill with pneumonia.

George R. Smith, foreman for Landers Brothers, builders, on the Crocker Paper Mill, had the misfortune to break his arm one day this week. H.

FOX RIVER VALLEY.

[FROM OUR REGULAR CORRESPONDENT.]

APPLETON, Wis., March 3, 1896.

No special change is to be noticed in the condition of business in this valley. Business generally is not what it ought to be in order to induce a pleasant feeling in the breast of the paper manufacturer. The stagnation seems to be widespread and felt in almost all lines of business, so that the paper trade is by no means the exception in this matter.

A good deal has transpired during the last week in water power matters in this valley. In the first place, however, it may be said that the fate of the new water power company is not yet decided, as was thought it would be by this time. It is announced that the Neenah and Menasha part of the agreement is pretty well settled, so that if things turn out as well down the river everything will be all right. The subscriptions at the Twin Cities are provided for, but it is now understood that the Green Bay and Mississippi Canal Company has not yet indicated exactly where it may be found in regard to the proceedings which are necessary for the closing of the deal. It is thought, however, that the end cannot be very far away, and the outlook seems to be a little brighter every day for the success of the undertaking which has been in hand for so many weeks.

The need of the organization of such a company as is proposed was emphasized last week, when, at a meeting of the manufacturers, it was decided to curtail the use of water again. The copious rains last fall and melting of the first snows which came filled up the lake, so that for several months the manufacturers have been using about 70,000 cubic feet of water a minute. During this time the water has been drawn down, however, until at present there is only about an inch remaining above the mark set by the Government, below which the water must not be drawn. It was thought best, therefore, to reduce the amount taken to about 50,000 cubic feet a minute, and the new order went into effect last Thursday and will be continued until further notice. There will be no noticeable effect upon the amount of product turned out in the valley, as there is plenty of steam power. The agreement was purely voluntary on the part of the manufacturers and not the result of suggestion or dictation.

The new batch of warrants issued by the United States District Attorney for the arrest of employees of the paper companies at Kaukauna for alleged illegal drawing of water for power purposes, alluded to last week, have been served, and the hearing occurred last week in this city. Employees of the Western Paper Bag Company and the Thilmany Paper and Pulp Mills were the victims. Two were bound over in $300 bonds and the examination of the third was postponed until the 5th inst. These prosecutions can only result in the release of the defendants, and are more and more coming to be regarded by the people of this part of the valley as persecution, or an attempt on the part of the officers to make business and gain fees at the expense of time, money and annoyance to the manufacturers.

Your correspondent learns that there is every prospect that a new paper and pulp mill will be built during the coming season in the paper making region contiguous to this valley. The pulp mill will be of ample size to supply the paper mill, which latter, it is said, will have two modern machines, and will make print and manilla papers. For the present further particulars are withheld, but the details will soon be presented.

For several years there has been talk at times of establishing industries in this valley calculated to consume some of the paper that is made here. Up to this time, however, little has been done along this line. It is understood just at present that an effort is being put forth, with good prospects of success, for locating here an institution to make oyster and ice cream buckets and small ware of a kindred nature. A gentleman who has been prominent in another line of manufacturing has sold out his business and is making arrangements to go into this.

The first of the looms that are being built by the Appleton Machine Company for the new wire works in this city is completed, and three others that are in course of construction will be finished at intervals of thirty days. As soon as the machinery can be installed the new works will go into operation. It is the only plant of the kind in the West and ought to have a very fine business.

It is expected that the new pulp mill of the Dells Paper and Pulp Company at Eau Claire, which has been built by O'Keefe & Orbison of this city, will be ready to begin grinding wood in about three weeks. Most of the machinery has arrived and is being set up.

T. W. Orbison, of the firm of O'Keefe & Orbison, departed last week for the city of Mexico, whither he has been sent by the Philadelphia Car Company to examine and report upon a water power in that neighborhood. He expects to be absent about three weeks. The use to which the power is to be put is not as yet revealed.

Work in the woods at the north in getting out pulp wood for the mills is just about finished for the season, and the men are returning to their homes. There is still some snow in the woods, but it is going off rapidly.

C. E. Pope, who has invented a number of labor-saving appliances for use upon paper machines, and who has of late been located in Kaukauna, departed last week for Lyons Falls, N. Y., where he will take charge of a large paper and pulp mill which is nearing completion. Mr. Pope visited the location last summer, and said before he left that the mill will be most modern in every respect, equipped with machines which will run at the rate of 400 feet a minute. A power of 4,000 horse power of water is said to be available.

Geo. Pratt, employed by the Nekoosa Paper Company, fell into the fan above the paper machine one day last week and received quite severe injuries.

J. A. Kimberly, Jr., of Neenah; Chas. Babcock, of Menasha, and J. H. Frambach, of Kaukauna, have purchased the fast sailing sloop yacht Corona, winner of many prizes on Minnetonka and White Bear lakes. The boat will be shipped to Neenah soon and will take part in the races the forthcoming season.

J. C. Armstrong, who has for several years been sales agent for the Combined Locks Paper Company, has resigned his position, to take effect April 1, and will remove to Chicago, where he will engage in business for some paper line.

Walter Ferguson has lately returned from the East at the close of a successful trip for the Appleton felts. FOX RIVER.

BOSTON.

[FROM OUR REGULAR CORRESPONDENT.]

EASTERN OFFICE PAPER TRADE JOURNAL,
61 FEDERAL STREET, BOSTON,
February 27, 1896.

Since Saturday last the paper manufacturing interests of New England have been subjected to considerable loss from high water and floating ice.

The melting snow and the heavy rains converted the overflowed streams and raging rivers into uncontrollable factors of destruction.

The State of Maine seems to have suffered most from the destructive freshet, although the damage to the paper manufacturing interests of the State is not so great as the early reports would indicate. In some parts of Maine where paper mills are located, little, if any, damage from water has been experienced, while other places have suffered a very heavy loss.

Private advices from Rumford Falls, Me., received by Boston parties to-day, the first mail received from that town since last Saturday, report no loss to the manufacturing plants there. Communication with the outside world was cut off and railroad transportation was stopped, the only annoyance to complain of at that place. All of the plants are reported to have been kept running right along.

From Cumberland, Me., reports are more serious, and if true the Cumberland Mills and other property owned by S. D. Warren & Co. suffered very heavy loss. The detailed reports from Cumberland as published in the city papers are very distressing, the damage to the interests of that section being estimated at a million dollars. How much of this falls upon S. D. Warren & Co.'s interests it is impossible to state at present, although the loss is given at $200,000 in late reports. On Monday last S. D. Warren left town for the mills at Cumberland, and he was seen to-day by the writer, but refused to give out anything for publication.

The Pejepscot Paper Company, at Brunswick, Me., is reported to have lost its dam, and the damage is estimated at over $100,000. The mill is said to have escaped injury and is running now. D. S. Cowles, president of the company, is in town to-day just from the mill, but he could not be found. W. H. Parsons, Jr., of New York, interested in the company, is also here and will return to New York to-night.

At Livermore Falls, Me., on the Androscoggin, some damage is reported, a part of the pulp mill being washed away. J. A. Record, connected with that property, was seen in the city to-day by parties in the trade, who state that Mr. Record said that the paper mill was not injured, although it

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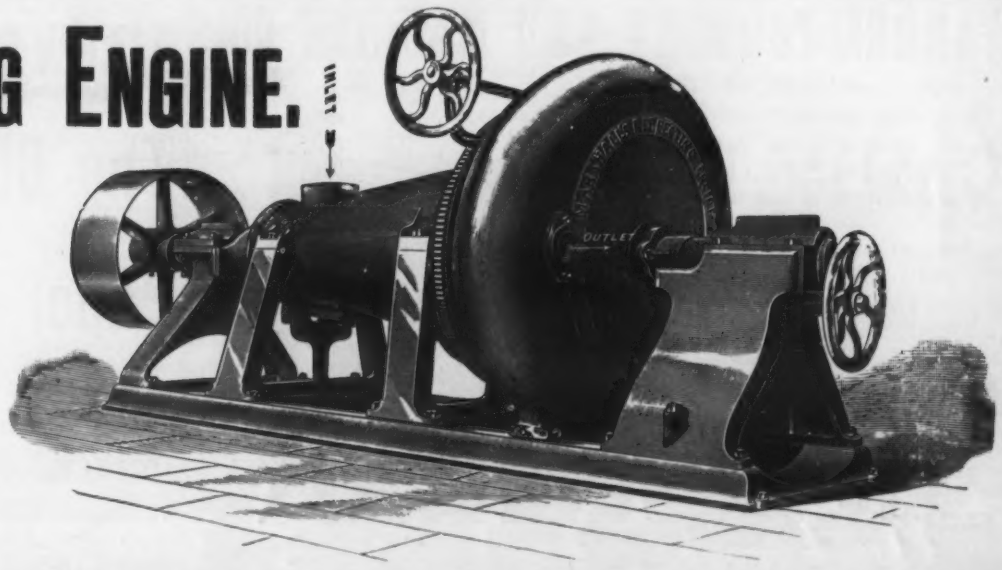

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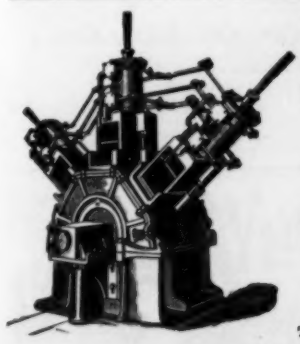

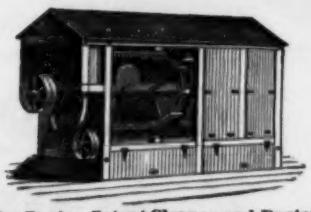

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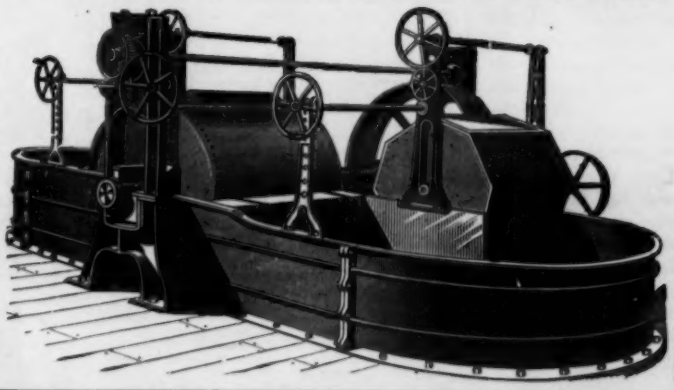

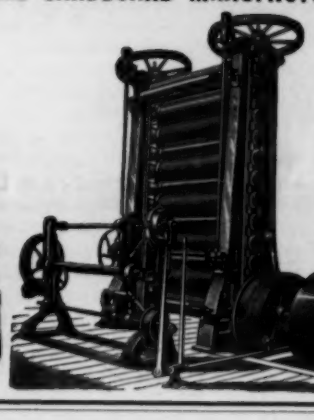

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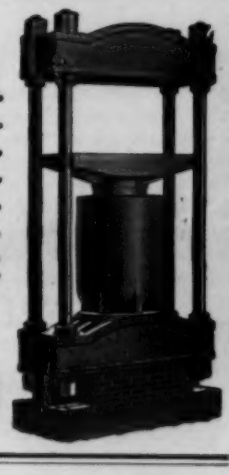

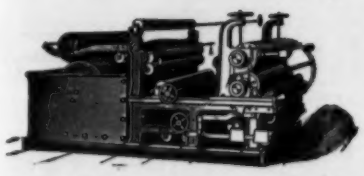

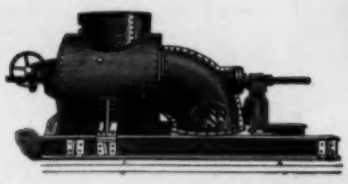

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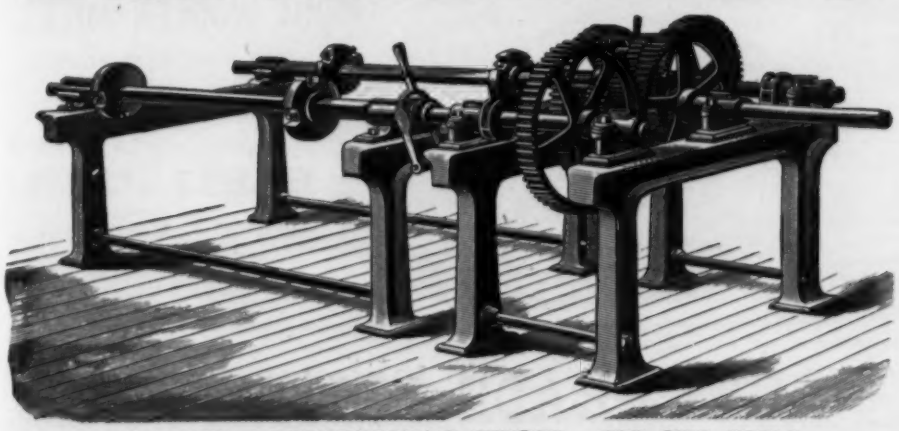

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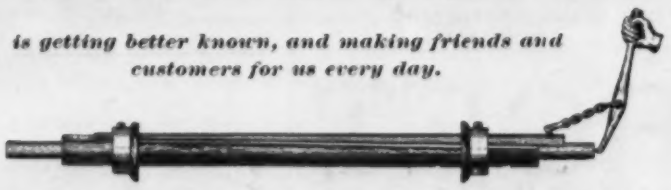

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Bangor Pulp and Paper Co., Orono, Me.
Moore & White Co., 2 Shafts, Philadelphia, Pa.
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PART II.

CHAPTER I.—**Cellulose.** Its chemical and physical properties, chemical relations and reactions.

CHAPTER II.—**Fibres.** Cellulose in its relations to the plant, the vegetable cell; the cell wall; changes which occur in the cell wall; lignin or incrusting matter; its chemical properties; characteristic markings of the cell wall in different fibres; characteristic cells other than fibres in different pulps. Classification of fibres: 1. Seed hairs; cotton, chemical and physical character of fibre, dimensions, analyses. 2. Bast fibres, as linen, jute, hemp, manilla, rhea, ramie, agave, sisal, adansonia, &c.; occurrence in plant, separation of filaments; character, size, distinguishing features of filaments and ultimate fibres, analyses and chemical properties. 3. Fibres and other cells from whole stems and leaves, as straw, esparto, bamboo; measurements and characteristics of fibres, yields, analyses; characteristic cells found with fibres. 4. Wood fibres; growth of wood; cambium layer; spring and autumn wood; sap and heart wood; resins; bark and knots; analyses of woods; specific gravities; ash; fuel values; occurrence and character of all woods used for pulp making.

CHAPTER III.—**Processes for Isolating Cellulose.** Rag boiling; special treatments for various fibres, as jute, straw, esparto; review of miscellaneous processes for treating wood; the water process, aqua regia, &c.; the soda process, history; preparation of liquors, boiling, washing, recovery, sources of loss; analyses of chemicals and liquors; the sulphite process, history; general principles; the different systems; liquor apparatus; preparation and analyses of liquors; digesters; linings; boiling; subsequent treatment of pulp; waste liquors; recovery. The sulphide and sulphate processes.

CHAPTER IV.—**Bleaching.** General principles; bleaching agents; bleaching powder; deterioration; analyses; preparation of bleach liquors; use in chests, engines, drainers; hot bleaching; acid bleaching; use of alum; chlorination and oxidation of fibre; washing stock, antichlors; loss in bleaching; ozone bleach; hydrogen peroxide; permanganate; sulphurous acid; special processes for various fibres.

CHAPTER V.—**Sizing and Loading.** Resin; preparation of size; free alkali; free rosin; alum; analyses of alums; free acid; basic alums; sizing power; resinate of alumina; moss; casein; wax; starch; animal sizing; preparation and use; drying; loading; analyses of clays, agalite, pearl hardening, &c.; use; retention; ash; combined water; effect of alum and starch.

CHAPTER VI.—**Coloring.** Mineral colors; vegetable and animal colors; aniline colors; chemical properties; effect of alum and traces of bleach or alkali in different colors; distinguishing tests; effect of different waters.

CHAPTER VII.—**Water and Water Supply.** Character and analyses of different waters; ground waters; surface waters; river water; artesian well water; hard and soft waters; boiler scale; effect of waters on size and colors; various systems of filtration; use of alum; softening water; self purification of streams; natural filtration; effect of storage; vegetation in ponds; crenothrix; consumption of bleach by waters.

CHAPTER VIII.—**Chemical Analysis.** Description of apparatus and methods for testing the purity and strength of all paper making chemicals, colors, &c.; common impurities and adulterants given; full description of methods of analysis for sulphite and soda liquors, bleach solution, alums, &c.

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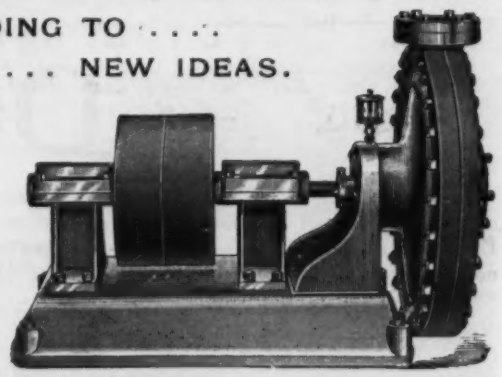

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was shut down a few days. It started up yesterday. The Otis Falls Pulp Company is reported to have lost a few piers. The damage to the Livermore Falls interests is stated to be about $25,000.

N. M. Jones, manager of the Katahdin Pulp and Paper Company, Lincoln, Me., while in town this week has had frequent communications over the wire with his mill, but no serious reports came to his notice. Advices state that the mill was closed down a day or two for the want of cars to load, but as railroad traffic had been resumed the mill had again started up and everything was running full blast.

News of the freshet from Bellows Falls, Vt., reached William A. Russell at Lawrence on Sunday, when he took a special train for Vermont and has remained at Bellows Falls and vicinity since, although no serious loss is reported to the Russell interests. At the company's Boston office it was stated that the Fall Mountain Paper Company was running all right after a day's shutdown. Several boom piers were carried away by the ice. Railroad traffic was not interrupted. The water at Bellows Falls is reported to have been a foot and a half higher than during the last spring freshet. Franklin, N. H., got plenty of water, but little damage resulted at that place. The Russell Mills at Lawrence, Mass., started up to-day, the only trouble experienced being the loss of production for a few days, as the machine room was deep in water.

From the same cause all of the mills at Lawrence, Mass., had to shut down. After a thorough cleaning up everything at Lawrence will be in full blast again.

The Haverhill Paper Company at Haverhill, Mass., got water in the engine room and stopped production for a day or two, but the mill is running now all right. The Glen Manufacturing Company, at Berlin Falls, N. H., is said to have experienced no trouble from the freshet.

The Hollingsworth & Whitney Company at its Federal street office is in receipt to-day of letters from its mills at Winslow and Gardiner, Me., but the letters were not alarming. At Winslow over 12 feet of water on the dam were reported; no logs were lost, but the tops of half a dozen piers were taken off. The report from Gardiner stated that the freshet was the worst ever known; train service had been suspended, but cars were being loaded, so that heavy shipments from the mills would be resumed as soon as railroad traffic opened.

The interruption to railroad transportation has been a serious matter, not only to the paper business but to other lines of trade. Boston paper dealers suffered somewhat from that trouble, as they have been unable to get paper from the mills and cannot make shipments to the many points on the line of roads cut up by the washouts and damaged bridges. The railroad companies will be heavy losers by this freshet, and not until the roadbeds are repaired and the bridges are replaced will traffic take on its old-time volume and trade resume its former proportions.

Under the conditions ruling during the past week it is hardly necessary to quote anybody's opinion concerning business. That the local paper business is quiet goes without saying.

Dealers in mill supplies are not having much to do this week. Importers are resting themselves and quietly waiting for the mills to begin to grind again.

The receipts of paper stock at this port for the month of February did not vary much from the imports of February of last year. In detail the receipts were 7,978 bales of rags, 3,511 bales of waste papers, 1,625 bales and 1,154 coils of manillas, 2,714 bales of flax waste, 3,881 bales of wood fibre, 27,719 bundles of ground wood pulp and 3,413 bags of sizing. For the same month of 1895 the imports were 8,010 bales of rags, 1,936 bales of waste papers, 2,495 bales and 831 coils of manillas, 3,692 bales of flax waste, 4,948 bales of wood fibre, 1,218 bundles of ground wood pulp and 2,713 bags of sizing.

Trade representatives reported in town this past week, besides those heretofore mentioned, were A. C. Moore and J. W. Flint, of Bellows Falls, Vt.; Wellington Smith, of Lee, Mass.; Charles S. Mayo, of Lawrence, Mass.; Fred. Temple and George Keyes, of Pepperell, Mass.; Chas. O. Woods, of Adams, Mass.; L. J. Powers, Samuel Rust and C. L. Davenport, of Holyoke, Mass.; W. J. Raybold, of Mittineague, Mass.; Mr. Biggs and James Wallace, of South Hadley Falls, Mass.; E. C. Wilson, of Rainbow, Conn.; Mr. Chalmers and C. L. Bassett, of New York.

Mortimer B. Mason, with his wife and son, left town last week for Europe, sailing from New York on Saturday last.

The next meeting of the Boston Paper Trade Association will be held on the evening of March 18. It will be the annual meeting, when officers to serve for the next twelve months will be chosen. The feature of the evening will be an entertaining lecture entitled "Picturesque Maine," with illustrations, by the noted entertainer Edward C. Swett, of Portland, Me., the most interesting lecturer on the public stage.

DELESDERNIER.

NORTHERN NEW YORK.

[FROM OUR REGULAR CORRESPONDENT.]

WATERTOWN, N. Y., March 4, 1896.

The fight between the Dexter Sulphite Pulp and Paper Company and the Taggarts is yet on. This has been referred to in THE PAPER TRADE JOURNAL before and is to determine if the Dexter people can float their pulp wood down the Otter Lake and Creek through what the Taggarts claim is their property.

Lyman R. Lyons in his lifetime was the owner of a large tract of land in the counties of Lewis and Herkimer. Out of that tract he sold 10,000 acres to Charles T. Partridge, which included Otter Lake and a part of Otter Creek. After his death his daughter, Mary L. Fisher, became the owner of the lands surrounding these 10,000 acres. Her lands do not touch Otter Lake, but are, at the nearest point, 25 to 30 rods from the lake. Otter Creek runs from the lake to the Black River, a distance of 30 miles. It has been for many years the custom of the pulp companies located on Black River to use the creek as a highway to float their logs and in 1892 it was made a highway by statute.

In May, 1895, Mrs. Fisher sold to the Dexter Sulphite Pulp and Paper Company the spruce timber on several lots of these lands, comprising 160 acres each, and gave the privilege of all rights of way which she possessed for the purpose of getting out the pulp wood. The Dexter Company then contracted to have the wood cut and floated down the creek in the spring. On November 16 last the Taggarts Company refused permission to the Dexter Company to take this wood across its lands, because the Dexter Company refused to make its log drive where it would be convenient to the Taggarts. Whether the Dexter Company had any rights in the matter is now being determined. Meanwhile the Dexter people have placed their 6,000 cords of spruce in Otter Creek.

Upon complaint of Col. James R. Miller, of Watertown, a director in the Globe Paper and Fibre Company, of Brownville, an action was begun some time ago by Attorney General Hancock to dissolve the company. Judge Hiscock, of Syracuse, granted an order to that effect last week, and N. P. Wardwell, cashier of the Watertown National Bank, has been appointed receiver.

It is pretty evident that the Globe people have had a family quarrel and the outcome is the dissolution of the company. Among the leading stockholders are H. Walter Webb, vice-president of both the New York Central and Hudson River Railroad Company and the Wagner Palace Car Company; Edgar Van Etten, the general superintendent of the New York Central; A. G. Leonard, private secretary to Mr. Webb, Charles Ehrlicher, James R. Miller, and T. T. Waller.

In commenting on the annual meeting of the American Paper Manufacturers' Association in New York and the election of George C. Sherman as one of the vice-presidents, the Watertown *Times* says:

"George C. Sherman, although comparatively a youngster in the paper business, is, it will be seen, in the foremost rank in it already in the estimation of his fellow manufacturers. Mr. Sherman was the secretary of the association last year, and this year he goes a step higher, and is now one of the vice-presidents. His popularity is by no means confined to his native valley, but that he wins for himself friends north, south, east and west is plainly apparent from the honor which was accorded him."

The latest news from the Newton Falls Paper Company is that it will shortly add another machine. The order has been placed with the Bagley & Sewall Company. This new machine will be 90 inches wide. The company expects to have its sulphite mill in full operation before April 1. The digesters are being lined now. The digester shells are from the McNeil Company and the lining is being done by the Non-Antem Digester Lining Compay. When completed the plant will have a capacity of 24 tons of paper a day, and with the new machine this will be run up to 40 tons.

W. E. T.

WESTERN NEW YORK.

[FROM OUR REGULAR CORRESPONDENT.]

NIAGARA FALLS, N. Y., March 5, 1896.

THE PAPER TRADE JOURNAL correspondent is able through the courtesy of A. F. Sparks, chief engineer of James Leffel & Co., of Springfield, Ohio, to give a very clear idea of the new turbine which his company is building for the Cliff Paper Company to supply power for the generators to run the paper machines by electricity. The turbine is of the double discharge design, 28 inches in diameter, of 300 horse power, with a full gate working under a 125 foot head. The wheel will be speeded when at highest rate at 625 revolutions per minute. This is an extraordinarily high speed, and it is calculated to be very uniform. The wheel runner is made of a special quality of bronze metal in one piece, firmly keyed to a heavy finished, hammered, wrought iron shaft. This runner is fitted with special metal cases, supplied with cast steel balance gates, the water flowing through these gates onto the runner, where it will be equally divided and discharged through suitable cast iron elbows on each side of the wheel case, thus balancing the pressure on the runner and not making it necessary to use thrust bearings on the wheel shaft. This part of the work is contained in a heavy, split cast iron globe case which has feeder pipe connections on the bottom side of the same. This case is fitted with large manholes and removable plates. On the top of the case is a large air chamber to cushion the water hammer which is liable to occur under this high head.

The wheel shaft is carried in automatic ring oiling bearings, which are mounted on heavy cast iron bridge trees, the case and bridge trees being substantially bolted to the top of heavy steel beams. Each end of the turbine shaft is fitted with insulated couplings directly connected to the electric generators. The bases of these generators are finished and mounted on the same steel beams which carry the turbine. The turbine gates are of special design, and connected by a suitable level with one of the latest and most improved designs of automatic speed regulating governors. This governor is guaranteed to give the very best efficiency for close speed regulation of the turbine under any sudden change of power which might be thrown on the turbine through the changing of the electric current on the generators.

Each elbow of the turbine is fitted with a draft tube some 22 feet long, connecting the discharge with the tail race. The turbine and its connections are made exceedingly heavy and of high grade material throughout, all parts being carefully tested before use in the construction of the wheel. It is designed that the speed regulation of this turbine shall be practically perfect for the particular duty required of it, as it is absolutely necessary that the electric current shall be furnished to the paper machines to operate the same at uniform speed under all conditions, as such a speed is required to insure satisfactory results and performance. The Cliff Paper Company has its pulp mill below the bank equipped with two of James Leffel & Co.'s double discharge horizontal turbines, operating under the same head of 125 feet and of the same design of turbines as the one to be used in the new power house. They are of larger dimensions, each developing 1,200 horse power at a speed of 215 revolutions per minute. These turbines have been in successful operation for over three years, and it is owing to their satisfactory operation and performance that James Leffel & Co. were awarded the contracts for the new turbine and several other larger turbines of similar design for electric light and power purposes. The new turbine is now about ready to set up.

W. E. T.

ROCHESTER, N. Y., March 6, 1896.

The humming of the pulp grinders and the roll of the paper machines in the new Genesee Paper Company's mill were heard when I descended into the gorge of the historic Genesee River, in the northern portion of this city, in my recent visit to the rejuvenated mill of the Rochester Paper Company.

I am not going to tell so much about the Genesee Paper Company this time as I am about its superintendent, Bernard Eilers. I had heard that Mr. Eilers had just completed a new grinder, which would soon be put on the market, and thought I would like to take a look at the machine. I found the superintendent in, and although somewhat loath to say anything just now he let me take a look at the new pulp grinder "on the quiet."

Mr. Eilers claims that this new grinder will be a "taker" with the trade. The machine consists of top and bottom frames, the joint being at the shaft centre. These are bolted together by eight quarter-inch bolts provided with jam bolts for setting up the pockets. There are four pockets directly opposite each other around the shaft joint, so arranged that when grinding the lift up is as much as the pressure down, thereby reducing the friction at the bearings to almost a minimum. The pockets are 26x16 inches in size, and have as much grinding surface as the ordinary grinder. The cylinder is 12 inches in diameter, with 21 inch stroke. The valve is of the engine slide pattern, with movable seat and valve. These are all bronze. The pinion to shift valve is of forged steel, with cut teeth. The pinion and valve stem are one forging.

The packing boxes, the glands and all nuts on the same are of brass. The inlet pipe is 1½ inch, while the outlet is 2 inches. All parts are large, so as to insure quick motion. The piston is of 3 inch steel. The cylinder is hemp packed and so arranged by a neat contrivance that it can be packed while grinding. Mr. Eilers showed me how this could be done. The cylinder is brass lined and of the best drawn tubing. The cylinder shaft is 8 inches in diameter, while the flanges, which are of cast steel, are 38 inches in diameter. These are screwed onto the shaft and stone and bolted with four 1 inch bolts.

The stone is 27x32 inches in diameter. The turning off machine is built to top side of pocket and so arranged that it turns off the stone or sharpens it at will, thus making it impossible to get the stone out of gear or true or higher on one side than on the other. The weights are of 2 inch steel, and the carriage, feeding bolts and nuts are of brass. The doors are 14x16 inches and are made of brass, light but strong. The distance between frames is 34 inches, giving a good clearance for stock. The bearings are 18 inches long and lined with the best babbitt metal. The boxes are provided with large oil ports and drips. These are bolted with four 1½ inch bolts, with jam bolts on each side to adjust lateral motion.

The machine weighs without stone and flanges 12 tons, and is made to stand a pressure of 400 horse power. The grinder is covered with one-eighth inch iron, hinged, and the casing can be taken off or turned up for easy access to all parts. The cylinder lies horizontally on top of the grinder, and the arms for the follower are fastened to each end. This gives by movement of the piston a simultaneous movement to the pockets. The chief advantage of this is that there is no loss of time in filling the pockets, and consequently no speeding up of the wheel by the sudden release of the pocket. Thus two pockets are continually grinding, while two are being filled. By this device Mr. Eilers claims that his grinder will be the fastest on the market, and that more work can be got out of it than from any other now on the market.

In having two pockets on one cylinder there is less chance, he claims, of grinding uneven pulp. For instance; suppose there was a soft piece of pulp wood in one pocket and a harder or knotty piece in the other. The one holds back on the other and prevents the soft piece from grinding too fast or the hard piece from not grinding fast enough. Another feature of the machine in having but one cylinder is the consequent less wear and tear, making it simple, strong and, as Mr. Eilers says, the most compact machine he has ever seen.

The machine has not been set up in the mill yet, but with the inventor I saw one at the Graves Elevator Works, where it was built and set up. There are some parts yet to be adjusted before the public will be permitted to inspect it, and for this reason the inventor did not want much said about it. The grinder has been patented.

I learned incidentally that Mr. Eilers was at work preparing a new wet-machine. His aim is to secure a machine which will press the pulp 60 per cent. air dry. The drawings and plans are now under way, and I hope also to secure a description of this as soon as it is perfected.

W. E. T.

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Recording Indicators.

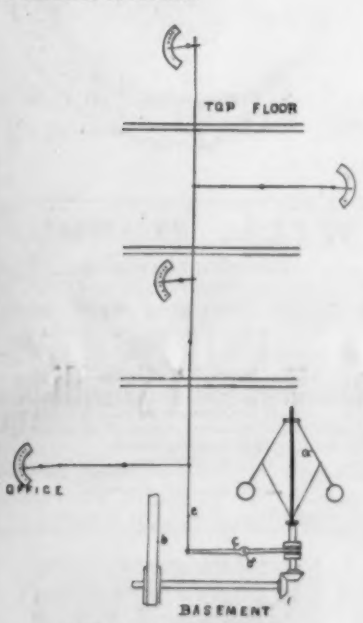
[WRITTEN FOR THE PAPER TRADE JOURNAL.]

By M. W. Danielsen.

Invention is constantly putting new safeguards on machinery, and any device which tends to supervise the care bestowed upon a steam boiler should be regarded with interest. The accompanying diagrams illustrate two new things. It may be remarked that the indicator diagram finds useful application in showing up a disordered governor. The suitable adjustment of the dash pot attached to the governor will usually correct, if not entirely overcome, the defect.

Variations in speed due to the operation of the governor are common, although the line of variation is seldom so great as that which frequently results from other causes. Whatever variation occurs tends to make the apparent work done by the engine different from what the average work is, and on this account an error is liable to be produced. Of course, in mills in which perfect indicator diagrams are employed, errors can be guarded against by always taking a number of diagrams consecutively on the same sheet, and using the average of the set and not any individual line. Attention is called to a novel way of keeping informed as to the speed.

This is a speed indicator which any mechanic can make and which can be placed in different rooms of the mill. The governor, *a*, is driven by the belt *b*. A lever, *c*, is pivoted at *d*. When the governor speeds up, the steel rod *e* is pulled down, and to this rod are attached the pointers of the dials arranged on the different floors, or in the office of the mill.



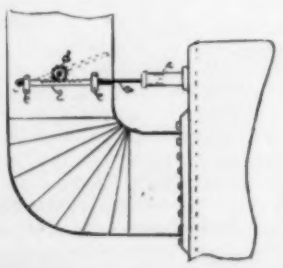
A Novel Speed Indicator.

The further down the lever *c* goes, the further around the hands on the dials will turn, thus indicating the speed. The dials may be placed in the office or engine room, at any desired distance from the engine. Not only from motives of safety, but from economical reasons as well, the gauging of speed will be found of value in any factory, because it shows whether fuel has been wasted or used wisely, and as its cost is small, it is a device which should commend itself. So long as the bearings are free and well lubricated the dials will record correctly. If perfection is desired in this invention the shank of the bolster bearings can be bored up from beneath in order to insert therein a lubricating tube or cup containing oil. This tube or cup should have its upper end formed slightly conical or rounded and screwed against a shoulder formed in the bore of the bolster for that purpose, such shoulder being left square and sharp so that the upper end of the bolster will bed against it, and so make a tight joint for itself, besides allowing free oiling.

Primarily, a steam plant consists of a boiler or steam generator, an engine or some kind of apparatus for transmitting the force contained in the steam, which has thus been generated, into turning the crank for the main shaft of the mill in order to set the machinery in motion. As simple as this would seem to be the details of a plant properly arranged and proportioned for its work involve a question which has kept busy some of the ablest theorists, and some of the most experienced men in engineering. Regardless of what may have been accomplished in various other directions, it is generally admitted that a boiler is incomplete if it is not fitted with a damper regulator, and few boilers are erected nowadays which are not provided with some device for automatically regulating the draught.

The benefits of automatic regulation of the draught are twofold. The fireman is relieved of all care of the dampers, and he can devote his attention to his legitimate work of firing and supply of feed water. He has enough to care for in simply managing the fires, if he properly attends to his duties. The uniform pressure secured by automatic regulation leads to uniform work in the service to which the steam is applied. If the steam is employed for driving an engine it undoubtedly leads to economy of fuel, because an engine uses steam to better advantage under a steady than under a fluctuating pressure. The most approved forms of regulators are composed of two parts, the regulator proper and a motor. The damper is operated by the motor, which is worked by either water or steam, and the office of the regulating apparatus is simply to open and close the valve which controls the motor. I have, however, experimented with a form of automatic damper governor, a drawing and description of which I furnish herewith.

Remove the check lever, regulator or governing attachments from off the end of the damper shaft and key on a gear, *d*. Drill a hole in the upper part of the boiler head and insert the cylinder *c*. The cylinder must be a bored tube and fitted with a piston and rod, *a*, and to the end of the lat-



New Type of Damper Regulator.

ter is fastened a toothed piece, *g*, the teeth of which mesh with the cogs of the gear *d*. The bearings *e e* are riveted to the stack as represented. When the steam pressure forces the piston outward the damper is closed accordingly. When the steam gets low, the receding piston opens the damper. This is another invention with which any engineer can experiment.

The efficiency of such a damper will be revealed when the boiler is subjected to a variable demand for steam, or when the fires are replenished.

I have often been asked to describe the differential motion.

The differential motion is a combination or compound of gears and cones which convey a variable speed to a winding process, in order that, as the windings increase in diameter as each layer is wound on, the speed will increase or decrease in the same ratio. The differential speed is obtained from the cones and is thence communicated through a series of gears, prominent among which is the epicycloidal wheel, commonly termed the compound gear, by which a retarding or accelerating motion is conveyed, as the occasion requires. The work of the compound or epicycloidal wheel, then, is to transmit a motion independent of that transmitted by the main speed. This speed is derived from the tapering diameter of the cones, and is so regulated that the surface velocity of the driven cone is just sufficient to wind a proper tension on, whether the object sought is to obtain an accelerating or retarding effect on the main speed, as the case may be. Therefore the compound motion transmits a speed which is always greater than the speed it receives from the fast bevel gear on the main shaft, and always less than the speed received from the sleeve gear connected with the flyer shaft.

For blow-off pipes there has been nothing invented much superior to the old straight-away or plug cock. To be sure, they wear out; everything does that; but to have their closing prevented by anything drifting into them is practically unknown, while with a globe valve a small piece of scale drifting under it may hold it open enough to drain the boiler.

Water Filtration.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

By W. H. Weston.

The necessity and importance of means for improving a water supply, either for drinking purposes or for manufacturing industries, lead to the employment of filter plants, and the efficiency to which these plants can be brought makes them of much value in practical business, because if well constructed and made of proper material the results attained will be very good in most instances. Of course there are places where good and satisfactory results cannot be attained with a filter which would work nicely under other conditions, but generally speaking the filtration of water can be done satisfactorily.

The cost of a plant will usually be moderate in proportion to the results attained, a given form of construction costing a variable amount, according to the situation, and whether the materials for its construction must be hauled a long distance or not. The construction of a filter plant is not at all complicated. It can be successfully carried on by practical judgment and careful and strict supervision of the details. If the soil at its location is hard pan of clay and gravel, impervious to water, a basin can be excavated in it, and no lining material will be needed; but if the soil is light, sandy or pervious, a clay puddle 2 or 3 feet thick must be placed on the bottom and side slopes.

The puddle should be made of homogeneous clay, with all lumps broken up, and the whole mass thoroughly puddled, well rammed, and rolled while being spread, care being taken not to put any more water than is necessary into the puddle when making it. Over the bottom of this basin and on top of the clay puddle there should be placed a layer of broken stone, slag, or some equivalent substance, 2 to 3 feet thick. In this layer lines of perforated cast or wrought iron pipe, or perhaps tile, should be imbedded. All of these lines of perforated pipe should lead to one central main connected with a collecting well, or clear water basin or reservoir, or tank. On top of this layer of broken stone there should be placed a layer of gravel, coarse at bottom and running finer toward the top of the layer, and upon this should be spread a layer of sand, from a foot and a half to 5 feet in thickness, according to the nature of the water to be filtered and the thoroughness of the required filtration. This sand layer should be carefully deposited, and put in layers, say, 6 inches deep at a time, and thoroughly raked over and rolled.

If sediment or mud collects very fast on the sand it of course becomes necessary to drain down the filter, and clear it out, and perhaps it may be necessary sometimes to scrape off 3 or 4 inches of the top sand if the sediment has worked into it to any extent. If this is done, an equivalent amount of sand must be put on again before starting the filter. In some instances of extremely dirty water it may be very advisable to place a layer of straw over the sand. This straw will catch much of the coarse matter, and, being easily changed, will give very good results. It will not then be necessary to scrape out so much of the sand as would otherwise be desirable. Thus the filter may not be thrown out of service for so long a time, and its cleaning will not cost so much.

Another method of construction may be had, and while it is more adaptable to filtration for municipal service, it may yet be of advantage in some places for manufacturing service. This construction is to place the layer of clay puddle over the bottom and side slopes of the basin, if such is necessary, as before cited; or if the soil is very strong and heavy the clay puddle may be dispensed with. The bottom strata being thus fixed, a layer of fine gravel and sand, with the sand on top, is placed, or sand alone may be used, this layer to cover the bottom and extend up the side slopes. The thickness should be 10 to 18 inches, according to circumstances. This layer of sand should be raked and rolled to an absolutely smooth and even surface. On this sand at the bottom and side slopes there should be placed a layer of hard burned brick, laid in hydraulic cement. This should be from three to five bricks thick, and the bricks on the side slopes to be laid edgewise to the plane of the slopes.

It is of the utmost importance to have the bottom and side slopes of the basin so solid and firm that no settlement will occur, otherwise the brickwork will be cracked. In laying the top courses of brick at the bottom of the basin a network of small drains may be formed, all radiating from one main drain or conduit at the middle of the basin. These drains should be loosely covered, so that the water can readily enter them. On this brickwork place a layer of clean well screened gravel 2 to 4 feet thick, the coarsest gravel at the bottom, and running to fine gravel at the top; this must be carefully and uniformly placed, and then on top of this layer place one of fine sand, of any thickness required by the special circumstances of the work of any given place. The sand used should be uniform, and perfectly clear of any other material.

In some places, where the water is very muddy, or contains much heavy sediment, it is an important advantage to have a settling basin in connection with the filter. The water being run to this settling basin before it goes to the filter, a large proportion of the matter in suspension will be deposited at the bottom of the basin, and will be prevented from collecting so fast on top of the filter sand. The settling basin must be placed at such a level that when full of water the latter will flow from near its top over into the filter. When the mud is collected at the bottom of the settling basin the water can be drawn down and the mud flushed out.

The water as it comes from the filter may go to a clear water basin or reservoir, or to a collecting well, from which it can be pumped as fast as it filters. Either this basin or the well should be at such a level as to allow the water to run into it by gravity from the filter.

The rate of filtration varies very much, according to the nature of the water and the perfection of the filtration required. A fair average for such a filter is about 2,000,000 to 5,000,000 gallons per acre of sand area per twenty-four hours. The frequency of cleaning varies greatly, and in instances where the water is very dirty it may be advisable to use duplicate filters.

The shearing strength of a rivet is usually less than its tensile strength, but nevertheless the friction of the two plates amounts to something, and this is in favor of the rivet, so that it is quite possible that the shearing strength and the friction together may equal the tensile strength.

If you have a shallow tank that you wish to fill with water and empty again frequently, put the discharge pipe in the side near the bottom. If it is located directly in the bottom away from the sides, the water goes out in the form of a miniature whirlpool, in the centre of which is a column of air; therefore the water cannot run out so fast as it would otherwise.

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IMPORTS AT NEW YORK.

FOR THE WEEK ENDED FEBRUARY 28, 1896.

An. Colors..	578	$36,346	Paper	986	$29,647
Alum	16	74	Steel Pens..	2	1,080
Alum's Cake	—	—	Stationery .	9	559
Bl. Powders	816	13,474	Slate Pencil	1	7
Soda Ash...	5,085	17,473	Clay	—	1,048
Soda, Caus.	526	6,968	J'te B'ts,&c.	—	—
Soda, Sal....	564	925	P.Hangings	152	7,831
Soda, Hypo.	—	—	Pap'r Stock	4,866	88,892
Ultramarine	226	2,573	Terra Alba	—	—
Books.....	313	43,609	Waste.....	234	47,726
Newspapers	420	10,564	Wood Pulp	1,447	6,789
Engravings.	50	3,232			
Ink.....	29	493		—	—
Lead Pencils	15	1,757	Totals....	16,355	271,167

Imports General Merchandise for the week ended February 28, 1896..... $8,615,976

IMPORTS OF PAPER STOCK AT NEW YORK.

FROM JANUARY 1 TO MARCH 4, 1896.

Whence Imported.	Rags.	Old Papers.	Chemical Fibre.	Ground Wood.	Manilla Stock.
	Bales.	Bales.	Tons.	Tons.	Bales.
Antwerp.....	533	...	283	....	2,047
Bremen.....	206	....	....	...	....
Bordeaux.....	1,043	....	....	....	....
Bristol.....	....	..	....	....	1,356
Calcutta.....	....	....	....	....	1,537
Copenhagen..	160	....	30	....	38
Dundee.....	....	....	....	....	778
Genoa.....	425	....	....	....	....
Glasgow.....	115	331	....	....	239
Gothenburg ..	....	....	172	....	164
Hamburg.....	1,580	51	243	....	280
Havre.....	....	....	....	....	302
Hull.....	1,474	....	278	....	2,941
Kobe.....	....	....	....	....	5
Leith.....	....	....	....	....	111
Leghorn.....	275	....	....	....	....
Liverpool.....	406	75	....	....	1,800
London.....	1,344	913	....	....	745
Marseilles....	....	....	....	....	1,158
Nassau.....	17	....	....	....	....
Rotterdam....	1,053	....	353	....	964
Stettin.....	3,183	....	25	....	456
Valparaiso....	9	....	....	....	....

NEW YORK IMPORTS.

FROM FEBRUARY 25 TO MARCH 4, 1896.

Paper Stock.

Castle & Gottheil, St. Cuthbert, Antwerp, 108 bs. rags.

Atterbury Brothers, by same, 43 bs. rags.

G. Rau, Friesland, Antwerp, 8 tons chemical fibre.

R. Helwig, by same, 15 tons chemical fibre.

Castle & Gottheil, Southwark, Antwerp, 10 tons chemical fibre.

J. Libmann & Co., Weimar, Bremen, 29 bs. rags.

R. H. Overton & Son, Critic, Dundee, 36 bs. manillas.

R. F. Downing, by same, 143 bs. manillas.

Train, Smith & Co., by same, 251 bs. manillas.

Train, Smith & Co., Furnessia, Glasgow, 21 bs. paper, 61 bs. bagging.

Devoy Brothers, Norwegian, Glasgow, 37 bs. paper.

J. Libmann & Co., Mab, Hamburg, 47 bs. rags.

G. Hamilton, by same, 45 tons chemical fibre.

Bateman & Taylor, by same, 30 tons chemical fibre.

S. Goldman, Amalfi, Hamburg, 20 tons chemical fibre.

F. Salomon & Co., Persia, Hamburg, 97 bs. rags, 50 bs. manillas.

Train, Smith & Co., La Bourgogne, Havre, 118 bs. bagging.

Train, Smith & Co., Colorado, Hull, 92 bs. rags.

Castle & Gottheil, by same, 50 bs. rags, 50 tons chemical fibre, 90 bs. bagging.

Seymour Paper Company, Buffalo, Hull, 335 bs. rags.

James Pirnie, by same, 50 bs. bagging.

Train, Smith & Co., Hindoo, Hull, 78 bs. rags.

Train, Smith & Co., Bovic, Liverpool, 93 bs. rags, 393 bs. manillas.

Train, Smith & Co., Europe, London, 79 bs. papers.

W. O. Davey & Son, Manitoba, London, 97 bs. manillas.

F. Bertuch & Co., Werkendam, Rotterdam, 14 tons chemical fibre.

Lewy Brothers, Thingvalla, Stettin, 166 bs. rags.

Castle & Gottheil, by same, 285 bs. rags.

J. W. Mason & Co., by same, 85 bs. manillas.

Lewy Brothers, Virginia, Stettin, 516 bs. rags.

Paper.

G. A. & E. Meyer, Noordland, Antwerp, 10 cs.

L. De Jonge & Co., by same, 9 cs.

Kupfer Brothers, by same, 23 cs.

W. Seyd, by same, 8 cs.

O. T. Melvin, by same, 4 cs.

J. W. Hampton & Co., by same, 30 cs.

J. G. Ramsay & Co., by same, 2 cs.

L. De Jonge & Co., Manitoba, London, 4 cs.

L. De Jonge & Co., Werkendam, Rotterdam, 18 cs.

Merchants' Dispatch, by same, 5 cs.

M. Adler, by same, 12 bs.

Knauth, Nachod & Kuhne, by same, 15 cs.

Schulz & Ruckgaber, A. W. Spies, Hong Kong, 20 cs.

G. W. Sheldon & Co., by same, 10 cs.

Henry Lindenmeyr & Sons, Persia, Hamburg, 104 cs.

Hensel, Bruckmann & Lorbacher, by same, 2 bs.

American Tobacco Company, La Bretagne, Havre, 20 cs.

G. H. Barbey, by same, 6 cs.

Dennison Manufacturing Company, New York, London, 20 cs.

Eagle Paper Company, Virginia, Stettin, 5 cs.

L. De Jonge, Spaarndam, Rotterdam, 3 cs.

Henry Lindenmeyr & Sons, by same, 23 cs.

E. Majert, by same, 10 cs. hangings.

L. C. Wagner, Friesland, Antwerp, 2 cs.

Kupfer Brothers, by same, 20 cs.

The Nepera Chemical Company, by same, 3 cs.

The Scovill Manufacturing Company, by same, 16 cs.

J. W. Hampton, Jr., & Co., by same, 30 cs.

W. Seyd, by same, 7 cs.

R. F. Downing & Co., by same, 20 cs.

L. De Jonge & Co., Amalfi, Hamburg, 15 cs. and 20 bs.

IMPORTS of Rags and other Paper Stock at the Port of New York for the month ended February 29, 1896, from the following named Ports, showing Quantities from each Port.

Whence Imported.	Rags.	Old Papers.	Chemical Fibre.	Ground Wood.	Manilla Stock.
	Bales	Bales	Tons	Tons	Bales
Antwerp	460	—	33	—	537
Bremen.....	206	—	—	—	—
Bristol	—	—	—	—	754
Copenhagen.....	160	—	—	—	38
Dundee.....	—	—	—	—	778
Glasgow.....	50	253	—	—	239
Gothenburg.....	—	—	172	—	164
Hamburg.....	412	34	143	—	160
Havre.....	—	—	—	—	195
Hull.....	755	—	120	—	816
Kobe.....	—	—	—	—	5
Leith.....	—	—	—	—	111
Leghorn.....	50	—	—	—	—
Liverpool	275	43	—	—	1,119
London	962	536	—	—	255
Marseilles.....	—	—	—	—	1,153
Rotterdam.....	419	—	14	—	831
Stettin.....	967	—	—	—	85
Valparaiso.....	9	—	—	—	—
Totals.....	4,725	908	482		7,340

Special List of Imports of Paper Stock at the Port of New York for the month ended February 29, 1896.

Importers.	Rags.	Old Papers.	Chemical Fibre.	Ground Wood.	Manilla Stock.
	Bales	Bales	Tons.	Tons.	Bales
Atterbury Brothers.	107	....	....	....	....
Bateman & Taylor..	....	....	73	....	....
Bertuch, F., & Co...	....	....	184	....	....
Castle & Gottheil ...	705	173	69	....	201
Cohen, A., & Co....	29	....	....	....	..
Darmstadt & Scott..	16	....	....	....	....
Davey, W. O., & Son	....	....	....	....	97
Devoy Brothers.....	97	215	....	....	....
Dutton, H., & Co....	....	70	....	....	777
Downing, R. F., & Co.....	....	....	....	....	143
Goldman, S.....	....	....	50	....	....
Graham, Hinckley & Co.....	....	....	....	....	176
Hamilton, G.....	....	....	45	....	....
Helwig, R	....	....	15	....	....
Jessup & Moore Paper Company.....	335	....	....	....	440
Lewy Brothers.....	927	...	...	....	....
Libmann, J., & Co..	161	....	....	....	....
McClintock, E. W ...	30	....	....	....	....
Mason, J. W., & Co..	....	....	....	....	806
Mack, L. C.....	41	....	....	....	....
Merchants' Dispatch Trans. Co.	....	....	....	....	106
Overton, R. H., & Son	....	....	....	....	36
Perkins, Goodwin & Co.....	....	....	....	....	24
Pirnie, James.....	154	....	....	....	869
Randall, J. C.....	122	....	....	....	....
Rau, G.....	..	...	...	....	....
Salomon, F., & Co..	466	34	33	....	160
Seymour Paper Co.	335	....	....	....	....
Sheldon, G. W., Co.	148	....	....	....	725
Stratford, G.....	....	....	....	....	....
Todd, J. H. L.....	....	....	22	....	....
Train, Smith & Co..	962	416	....	....	2,693
Totals	4,725	908	482	....	7,340

Special List of Imports of Paper Stock at the Port of Boston for the Month Ended February 29, 1896.

Importers.	Rags.	Waste Papers.	Manillas.		Flax Waste	Wood Fibre.	Sizing.
	Bales.	Bales.	Bales.	Coils.	Bales.	Bales.	Bags.
Train, Smith & Co.....	4,991	847	153	69	491	....	381
Edwin Batterworth & Co.....	*1,408	253	1,418	79	....	....	1,959
Horace Dutton & Co.....	1,183	213	54	1,006	2,000	....	....
E. P. True.....	...	381	....	....	....	....	....
T. P. Ring	....	50	....	....	124	....	....
W. F. Corne.....	80	....	....	....	....	....	....
S. D. Warren & Co.....	114	....	....	....	....	....	....
Warren & Co.....	....	....	....	....	....	....	60
Wheelwright Paper Co.....	....	609	....	....	...	....	....
Crocker, Burbank & Co.....	....	681	....	....	....	....	....
Felix Salomon.....	....	217	....	....	....	....	....
Parsons Paper Co.....	96	....	....	....	....	....	....
J. B. Moors & Co.....	87	198	....	....	....	....	....
Fred Bertuch & Co...	....	....	....	....	....	682	....
Castle & Gottheil.....	....	....	....	....	....	200	....
Page, Newell & Co.....	....	....	....	....	....	1,611	....
R. Helwig.....	....	....	....	....	....	792	....
Morey & Co.....	....	....	....	....	....	406	....
Chas. D. Brown & Co.....	....	....	....	....	....	†5,540	....
Geo. A. Clark.....	....	....	....	....	....	†17,179	....
E. W. McClintock.....	....	....	....	....	....	....	660
Thomas Groom & Co	....	....	....	....	....	....	224
Baeder, Adamson & Co.....	....	....	....	....	....	....	80
J. W. Barlow.....	....	....	....	....	....	....	‡42
A. & C. W. Holbrook.....	....	....	....	....	....	....	‡7
Totals.....	7,978	3,511	1,625	1,154	2,714	26,600	3,413

* Includes 350 bales of cotton waste. † Bundles of ground wood pulp. ‡ Bales.

BOSTON IMPORTS.

FROM FEBRUARY 27 TO MARCH 4, 1896, INCLUSIVE.

Paper, &c.

D. B. Updike, Carinthia, Liverpool, 3 cs. paper.

Wm. Guild & Co., by same, 11 bs. periodicals.

Wilson & Sons, Sarmatian, Glasgow, 12 cs. paper.

Dennison Manufacturing Company, Cambroman, Liverpool, 4 bs. tissue paper.

Dennison Manufacturing Company, Sagamore, Liverpool, 6 bs. tissue paper.

J. Farley & Co., Borderer, London, 2 bs. paper hangings.

W. A. Nosworthy, by same, 7 cs. paper.

C. H. Angell & Co., by same, 2 cs. paper hangings.

Paper Stock.

Train, Smith & Co., Sarmatian, Glasgow, 138 bs. rags, 84 bs. waste papers, 69 coils manillas.

E. P. True, by same, 106 bs. waste papers.

Train, Smith & Co., Cambroman, Liverpool, 184 bs. waste papers.

Horace Dutton & Co., by same, 76 bs. rags.

E. Butterworth & Co., by same, 159 bs. manillas.

E. Butterworth & Co., Roman, Liverpool, 557 bs. manillas.

E. Butterworth & Co., Sagamore, Liverpool, 280 bs. rags.

E. Butterworth & Co., Lancastrian, Liverpool, 89 bs. rags, 23 bs. waste paper, 79 coils manillas.

E. Butterworth & Co., Armenian, Liverpool, 44 bs. rags, 54 bs. cotton waste, 63 bs. waste paper, 134 bs. manillas.

J. B. Moors & Co., Carinthia, Liverpool, 1 bale rags, 42 bs. waste paper.

Train, Smith & Co., Chicago, Hull, 505 bs. rags, 40 bs. manillas, 84 bs. flax waste.

Horace Dutton & Co., by same, 200 bs. flax waste.

Train, Smith & Co., Borderer, London, 435 bs. rags, 26 bs. manillas.

T. P. Ring, by same, 124 bs. flax waste.

Horace Dutton & Co., by same, 153 bs. rags, 68 bs. waste paper.

Wheelwright Paper Company, by same, 48 bs. waste paper.

Crocker, Burbank & Co., by same, 124 bs. waste paper.

Parsons Paper Company, by same, 43 bs. rags.

E. Butterworth & Co., by same, 39 bs. waste paper.

E. P. True, by same, 54 bs. waste paper.

Wood Fibre.

Fred. Bertuch & Co., Chicago, Hull, 312 bs.

Page, Newell & Co., by same, 798 bs.

Wood Pulp.

Geo. A. Clark, Arizona, Liverpool, N. S., 1,855 bdls.

Chas. D. Brown & Co., Careta, Port Medway, N. S., 4,000 bdls.

Sizing.

E. W. McClintock, Carinthia, Liverpool, 403 bags.

Warren & Co., Sagamore, Liverpool, 60 bags.

J. W. Barlow, by same, 42 bs.

A. & C. W. Holbrook, by same, 7 bs.

E. Butterworth & Co., Lancastrian, Liverpool, 280 bags.

E. Butterworth & Co., Armenian, Liverpool, 288 bags.

Bleaching Powder.

J. L. & D. S. Riker, Armenian, Liverpool, 270 cks.

Morey & Co., by same, 80 cks.

Jerome Marble & Co., by same, 47 cks.

Reed, Halliday & Son, by same, 47 cks.

Morey & Co., Lancastrian, Liverpool, 80 cks.

J. L. & D. S. Riker, Sagamore, Liverpool, 209 cks.

J. L. & D. S. Riker, Roman, Liverpool, 172 cks.

J. L. & D. S. Riker, Cambroman, Liverpool, 184 cks.

Reed, Halliday & Son, Carinthia, Liverpool, 142 cks.

Caustic Soda.

Edward Hill's Sons & Co., Carinthia, Liverpool, 50 drums.

J. L. & D. S. Riker, Roman, Liverpool, 100 drums.

Warren & Co., Sagamore, Liverpool, 100 drums.

Alkali.

Linder & Meyer, Lancastrian, Liverpool, 25 cks.

Soda Ash.

Wing & Evans, Cambroman, Liverpool, 14 cks. and 80 bags.

A. Klipstein & Co., Roman, Liverpool, 85 cks.

Wing & Evans, Sagamore, Liverpool, 14 cks. and 80 bags.

Warren & Co., by same, 73 cks.

Morey & Co., Lancastrian, Liverpool, 36 cks. and 200 bags.

Wing & Evans, by same, 96 cks. and 800 bags.

Morey & Co., Armenian, Liverpool, 36 cks. and 200 bags.

Wing & Evans, by same, 65 cks. and 1,300 bags.

Soda Crystals.

Warren & Co., Roman, Liverpool, 140 bbls.

Warren & Co., Sagamore, Liverpool, 140 bbls.

Crude Sulphur.

Linder & Meyer, Lancastrian, Liverpool, 1,670 bags.

Linder & Meyer, Armenian, Liverpool, 1,669 bags.

Pulp Stones.

Lombard & Co., Chicago, Hull, 40 stones.

PHILADELPHIA IMPORTS.

FOR THE WEEK ENDED FEBRUARY 29, 1896.

Paper.

Chas. Beck Paper Company, Australia, Hamburg, 24 cs.

Order, by same, 28 cs.

Paper Stock.

R. Helwig, Illinois, Antwerp, 270 bs. wood fibre.

Soda Ash.

Brown Brothers & Co., Belgenland, Liverpool, 200 bags.

Bleaching Powder.

Order, Illinois, Antwerp, 113 bbls.

Brown Brothers & Co., by same, 189 bbls.

China Clay.

Dunn Brothers, Belgenland, Liverpool, 400 cks.

Crude Sulphur.

Order, Belgenland, Liverpool, 834 bags.

EXPORTS of Paper, &c., from New York for the Week Ended March 3, 1896.

BOOKS, to British Australasia, 7 cs.; Bremen, 2 cs.; Brazil, 1 pkg.; British Guiana, 1 pkg.; British possessions in Africa, 70 cs.; British West Indies, 15 cs.; Central America, 23 cs.; Chili, 1 cs.; China, 1 cs.; Ecuador, 2 pkgs.; Havre, 2 cs.; Japan, 9 cs.; Liverpool, 18 cases; London, 45 cs.; Mexico, 4 pkgs.; Uruguay, 1 cs.; Southampton, 2 cs.; Colombia, 3 cs.; Venezuela, 14 pkgs.; Cuba, 1 pkg.

PAPER, to Colombia, 948 pkgs.; Venezuela, 11 pkgs.; Mexico, 76 pkgs.; New Zealand, 275 pkgs.; Antwerp, 1 cs.; British Guiana, 8 pkgs.; Cuba, 28 pkgs.; Berlin, 3 cs.; British West Indies, 454 pkgs.; Brussels, 15 pkgs.; Central America, 42 pkgs.; British Australasia, 1,004 pkgs.; Ecuador, 4 pkgs.; Bremen, 109 pkgs.; Dutch West Indies, 10 pkgs.; Brazil, 256 pkgs.; Hayti, 2 pkgs.; Havre, 42 cs.; British possessions in Africa, 10 pkgs.; Japan, 3 pkgs.; Liverpool, 76 pkgs.; London, 275 pkgs.; Southampton, 16 cs.; San Domingo, 61 pkgs.

STATIONERY, to British East Indies, 2 cs.; British West Indies, 12 cs.; Brazil, 2 pkgs.; Central America, 10 cs.; British possessions in Africa, 15 cs.; Cuba, 6 pkgs.; Chili, 11 cs.; Dutch West Indies, 3 cs.; Ecuador, 1 cs.; Hamburg, 1 cs.; Hong Kong, 1 cs.; Hull, 1 cs.; Japan, 12 cs.; London, 60 cs.; Mexico, 58 pkgs.; New Zealand, 18 cs.; Sandwich Islands, 10 cs.; Colombia, 3 cs.; Venezuela, 6 pkgs.

TWINE, to Brazil, 18 bs.; Peru, 1 bale; British West Indies, 2 pkgs.; China, 13 pkgs.; Central America, 2 bs.; Hong Kong, 4 bs.; Mexico, 2 bs.; San Domingo, 4 bs.; Venezuela, 3 bs.; Colombia, 12 bs.

SANDPAPER, to British West Indies, 2 cs.; Central America, 2 bs.; London, 66 bdls.; Mexico, 8 pkgs.; Uruguay, 16 cs.; Venezuela, 4 pkgs.

PAPER FIBRE, cases, to Havre, 4.

PLAYING CARDS, cases, to Brazil, 1; Hayti, 12; Japan, 8; London, 3; New Zealand, 1.

TAGS, to British West Indies, 3 pkgs.; Mexico, 4 cs.; New Zealand, 3 cs.

WALL PAPER, to Bristol, 1 cs.; Mexico, 101 pkgs.; British West Indies, 1 cs.; Venezuela, 21 pkgs.

STRAWBOARD, bales, to Cuba, 8.

PAPER TUBES, cases, to Bolton, 5.

PAPER CAPS, cases, to Hamburg, 1.

CARDBOARD, bundles, to Cuba, 7.

PAPER HOLDERS, cases, to British possessions in Africa, 1.

PASTEBOARD, cases, to Brazil, 1.

LABELS, cases, to Mexico, 1.

AGGREGATES AND VALUES.

Wood Pulp, bdls.....	45	$3,644
Wood Pulp, rolls.....	—	—
Cotton Waste, bs.....	21	106
Rags, bs.....	100	2,471
Paper, reams.....	—	—
Paper, pkgs.....	3,253	34,880
Paper, cases.....	68	1,260
Books, cases.....	180	9,797
Books, pkgs.....	41	3,103
Stationery, cases.....	148	9,565
Stationery, pkgs.....	85	2,375
Rosin, bbls.....	2,215	7,296
Totals.....	6,074	$73,547

Exports General Merchandise for the week ended March 3, 1896..... $7,022,957

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NEW YORK: SATURDAY, MARCH 7, 1896.

SPECIAL NOTICE.

Part 4 of "Hofmann's Treatise on Paper Making" has been delivered to subscribers. Thus far we have published 288 pages; each part consists of seventy-two body pages and cover. We translate the work from German into English, and print it with good ink, in clear type, on first-class paper, which will stand the test of time. Great care is taken in printing and locating the many illustrations. "Hofmann's Treatise" ought to be in the library or office of every paper manufacturer, and also owned by every superintendent and paper maker who is ambitious to be fully posted on his trade. The price is $1 in advance for each part. If your order has not already been given send $4 and the four parts will be sent to you; or you can send $5 or $10, and as many parts will be forwarded in due course as there are dollars in your remittance.

HOWARD LOCKWOOD & CO.

THE question of a new custom house at New York has been under discussion at the Chamber of Commerce, where resolutions favoring rebuilding on the present site in Wall street were recently passed. There are many excellent reasons for the retention of the present location. It is centrally situated in its relation to the great financial institutions of the Government and the city, and it seems to be quite possible that, with the present improvements in building operations, an edifice might be erected which would meet all of the requirements of customs business for many decades. On the other hand, the Bowling Green site offers opportunities for architectural effects which Wall street does not afford, and being open on all sides to light and air it would, perhaps, afford more cheerful and healthful possibilities. The main thing, however, is a new custom house. That is what is needed, and badly.

A NEW grinder for wood is illustrated and described on the first page of this issue of THE PAPER TRADE JOURNAL. The nature of the improvement consists in means for feeding the wood to the stone automatically yet continuously, the speed of feed being regulated so as to conform to the speed of the grinder.

THE Nicaragua Canal scheme is meeting some sharp but ill-advised opposition from Mr. Nimmo, former chief of the Bureau of Statistics. One objection which he offers is that the canal site is located in the region of perpetual calms, and for that reason would be unavailable for sailing vessels, which would encounter delays or be obliged to resort to towing. He also thinks that tolls would be prohibitive for such craft, as they would be equal to the other operating expenses for several months. It would seem as if our wiseacres might study the commerce of the great lakes to some advantage. There it is the number of trips a vessel can make which insures profits, not cheap operating expenses, and as canals and towing make the length of time consumed by trips much shorter, they are found to be profitable aids to paying business. Why the principle is not the same with ocean traffic is not easy to understand.

THE National Association of Manufacturers seems destined to arouse antagonism. Last year the absurd basis of representation gave serious offense to Southern manufacturers, and now the St. Louis Manufacturers' Association has decided to withdraw from the national organization on the plea that its basis of action is too largely inspired by politics and a desire to be conspicuous in political affairs. It is rather a difficult thing for men of energy and action to assume a strictly non-partisan attitude toward matters which seem to vitally concern their business interests, but it is really the only basis on which a national industrial organization can hope to perform successful work. Men may and have the right to be as radical as they please in their private capacity, but when men of all shades of political opinion are invited to unite in a work of importance to national business prosperity wisdom dictates that political bias should be kept out of sight as much as possible. Only through such personal effacement can good feeling and real coherency of purpose be achieved.

A BILL now pending in the House of Representatives at Washington proposes to change the classification of mail matter so that a large number of publications will be cut off from the benefits of cheap postage, and a correspondent who sets forth his views on this subject in another column invites the attention of paper manufacturers to the grave results which he suggests will follow should the bill be enacted. If the second-class classification of mail matter, as at present existing, were designed solely for and established in the interest of any one industry it should be changed. Legislation for special interests is always abominable, and most so if it restricts public rights; but this view cannot be taken of the existing classification of second-class matter. In fact, the wide distribution of newspapers and other publications is to the public good, and the means for facilitating this ought not to be narrowed. The interests of the paper trade are only incidental to the public benefits derived, and we feel therefore that we can with good reason advise the co-operation of the trade in opposing anything which promises to effect such a large reduction in the distribution of the paper making output. That there have been and are abuses of second-class mail privileges cannot be denied; but to effect reform in this particular it is not necessary to make the change so far reaching and radical. It is urged that second-class matter is a burden upon the revenues of the Post Office Department, which would not show an annual deficit were they relieved of it. This is a bad argument. Had it not been for cheap postage the postal revenue would have shown long ago a much larger falling off and the extension of postal facilities would have been so cramped that it would to-day be difficult to meet public requirements. We assert that second-class matter has been no mean factor in building up the postal business of the country and enlarging its facilities.

PAPER STOCK IMPORTS.

The imports of rags and other paper making fibres—jute butts excepted—at the port of New York during the month ended February 29, as reported, amounted to 12,973 bales and 482 tons, the difference in quantities, compared with the corresponding month of 1895, being an increase in rags of 935 bales, in old papers an increase of 555 bales, and in manilla stocks an increase of 2,353 bales. There was no wood pulp imported during February, and of chemical fibre 420 tons less than the January imports were brought in. The appended tabulation shows the quantities of paper making materials of the kinds mentioned which were reported as having been imported during the month of February for the last five years:

	1896.	1895.	1894.	1893.	1892.
Rags.....bales.	4,725	3,790	1,990	13,088	12,459
Old Papers.....	908	353	652	2,710	171
Manilla Stocks..	7,340	4,987	6,712	12,437	22,344
Wood Pulp,tons.	.....	.....	.....	.....	.....
Wood Fibre.....	482	1,010	486	961	902

The arrivals from the different ports were as follows: Antwerp, 460 bales rags, 33 tons chemical fibre, 637 bales manillas; Bremen, 206 bales rags; Bristol, 754 bales manillas; Copenhagen, 160 bales rags, 38 bales manillas; Dundee, 778 bales manillas; Glasgow, 50 bales rags, 293 bales old papers, 239 bales manillas; Gothenburg, 172 tons chemical fibre, 164 bales manillas; Hamburg, 412 bales rags, 34 bales old papers, 143 tons chemical fibre, 160 bales manillas; Havre, 195 bales manillas; Hull, 755 bales rags, 120 tons chemical fibre, 816 bales manillas; Kobe, 5 bales manillas,; Leith, 111 bales manillas; Leghorn, 50 bales rags; Liverpool, 275 bales rags, 43 bales old papers, 1,119 bales manillas; London, 962 bales rags, 538 bales old papers, 255 bales manillas; Marseilles, 1,153 bales manillas; Rotterdam, 419 bales rags, 14 tons chemical fibre, 831 bales manillas; Stettin, 967 bales rags, 85 bales manillas, and Valparaiso, 9 bales rags.

Watermarks.

BY DANDY.

There was certainly an excess of moisture in the East this week, but there is no way of making a claim for it in most cases. The flood played havoc at many points, and city trade is now worrying over delayed supplies.

One manufacturer East—not of paper, however—was informed of a plan whereby he will be able to collect from the insurance companies for the loss of his plant. He had stored in his cellar a number of barrels of lime, and when the water came it started the lime to work, and the building was burned down.

Calendars which go to paper manufacturing districts where spring freshets are the rule should have this memorandum: "February 1.—About this time lay in a stock of lime in cellar."

A paper maker who last summer threatened to get out a search warrant in order to find the stream which ordinarily furnishes the power to his mill, and who was very energetic in "cussing" the rivulet for its low condition, has this week been overwhelmed with water, and writes: "We are short of everything except water and stock."

He has been known to be up to his neck in water, but he was very careful that none of it rose above his chin.

Down in Pennsylvania there is a tribe of Indians, the name of which is unpronounceable and which no one attempts to spell. The tribe has recently elected a new head medicine man, who is known on Poor Lo's record as Great Chief Ben-ne-wah Reist-te-won.

I don't know anything about it, but the trade need not be surprised to see the "heap big medicine man" come to town in full war paint, with scalps hanging to his belt and the pipe of peace nowhere in sight. He used to play George Washington and carry a hatchet, but now he swings a tomahawk.

The latest application of the Monroe doctrine is in the Salvation Army.

If the railroad companies could get as much for carrying paper as the Government proposes to charge under the terms of the bill now in Congress, what fat dividends could be declared! Publishers could then go into the freight carrying business, and in a short time retire rich.

A paper stock man whose better half has had a great deal of trouble with her "queens of the kitchen" now proposes to submit each new applicant to the Roentgen rays, with the hope that he may thereby gain some insight into her characteristics before engaging her to boss the range.

These X rays are great, and if the experiments continue somebody is going to get into trouble. One manufacturer says that now he does not need to open bales of stock. He photographs them, and the moisture in gunny, the rubber in rags, &c., all show up in the picture.

An exchange says: "Superintendent Butler, of the Valley Mill, requests us to say that the statement made in a Pittsfield paper that he broke his finger by a fall on the ice in this village last week is entirely incorrect." Now, that's a fine state of suspense in which to leave the reader. If he didn't break his finger what did he break, or if it was his finger and it was not broken on the ice, how was it broken? Or if it was his finger and it was broken on the ice, but not "last week" or "in this village," where and when did the accident happen? Will the "super" kindly hand down to posterity a correct version of the affair.

As it stands at present, perhaps he didn't break it on the ice. He may have cut it on the glass.

Communications.

The Post Office and the Paper Makers.

WASHINGTON, D. C., March 3, 1896.

Editor Paper Trade Journal:

A great wail has gone up of late years from the post office over the vast increase of second-class mail matter in the form of periodicals, and the increased labor and cost of handling it. The broad and liberal laws affecting mail matter and the growing education and interest of the people in the news of the world and in literature have stimulated the production of newspapers and periodicals of every description beyond all precedent. Another influence, perhaps as great as all others, has shared largely in the bringing about of this extraordinary development, and this is the reduction in cost of white paper. So many new materials have been utilized in the manufacture of paper, processes have been cheapened through improved machinery, and, while wages have not decreased, the product of our paper mills has been enormously increased and reduced in price at the same time. The statistics of paper making reveal this growth, which is familiar to the readers of THE JOURNAL. Our prosperity is a part of the general prosperity, and it may be urged that paper, so necessary to publicity, is a prime factor in the general development. Anything which tends to diminish the consumption of white paper may be set down at once as harmful to commerce and industry and likely to diminish the wages of labor and the returns of capital.

A bill has been recently introduced in the House of Representatives taking out of the classification of second-class mail matter sample copies of periodicals, all books or reprints of books, whether they be sold by subscription or otherwise, or whether they are issued as premiums or supplements, or form parts of regular newspapers or periodicals, and all unsold publications which heretofore have been remailed from one news dealer to another. This bill further provides that all extra numbers of second-class publications sent to the publishers thereof, acting as the agent of an advertiser or purchaser, to addresses furnished by the latter, shall also be taken out of this classification of mail matter.

If enacted it would make it practically impossible to start a new periodical, as the only way in which a new periodical can be placed before the public is by means of the distribution of samples. It would therefore stop at once the production of new periodicals intended for general circulation; but this is not the main influence which would be exerted by this bill on the business of paper makers. Nearly all trade and advertising journals fill out their subscription lists by means of free and sample copies, and extra editions for advertisers. All of these would immediately be cut off from the privileges of second-class mail matter, and the lists of these journals reduced to regular paid subscribers. The fate of three-quarters of these journals under such a régime would be a brief existence, followed by bankruptcy. The entire library issues, which constitute so great a feature of the second-class mail matter, are eliminated, and their discontinuance would quickly follow. This, with the stopping of supplements and extras, could not fail enormously to curtail the demand for white printing paper.

The paper manufacturers have grave reasons to be alarmed. Their interests, equally with those of the publisher, are threatened by H. R. 4566, the bill introduced by the Hon. Eugene F. Loud, and which is now pending. If it should become a law there will be a reduction in the consumption of white paper of 150,000 tons per annum. It is unnecessary for me to dwell on the results of this reduction. It would be a national calamity and would be felt by the industrial army engaged in the manufacture of paper from Maine to Florida. Our people should bestir themselves; every member of Congress should be written to by his constituents, and urged to vote against this bill, on the simple ground of its probable effects upon a prosperous American industry. JOHN ELDERKIN.

Changes, Removals and New Firms.

The *News*, Wallaceburg, Ont., is a new paper.

W. P. Thurston, publisher, Frederick, S. Dak., has sold out.

The *Morning Telegram*, Bridgeport, Conn., is a new paper.

Goddard & Smith, publishers, Britton, S. Dak., have sold out.

J. H. Bell will start in the wall paper business at Decatur, Ill.

The *Evening News*, Washington, D. C., has suspended publication.

John Low has gone into the wall paper business at Tarrytown, N. Y.

New Britain, Conn., has a new paper called the *Morning Dispatch*.

Chester P. Walter has opened a wall paper, &c., store at Fogelsville, Pa.

N. Yeager and F. Calman have opened a wall paper store at Danville, Ky.

F. Flemazro has opened a store at Philadelphia, Pa., to deal in wall paper.

L. E. Jacques, stationer, &c., Taylor, Tex., has sold out to L. O. Harvey.

J. G. Crawford, Bellaire, Ohio, has opened a paper hanging, &c., establishment.

The Bay State Wall Paper Company has gone into business at Westfield, Mass.

Foss & Johnson have opened a wall paper, &c., store at Grand Forks, N. Dak.

Strickle Brothers, Bloomington, Ill., have opened a wall paper store at Normal, Ill.

J. F. Straup and F. G. Smitch have opened a wall paper store at Lansford, Pa.

G. B. Wood, wall paper dealer, Fitchburg, Mass., has sold out to Joshua Sweet.

Beggs & Carnwright, Newburgh, N. Y., have gone into the wall paper, &c., business.

Holland & Tebbutt, dealers in wall paper, Sandusky, Ohio, have dissolved partnership.

John B. Murphy, dealer in wall paper, &c., Biddeford, Me., has sold out to Hiram Dolby.

The Continental Twine and Cordage Company, Brantford, Ont., has been dissolved.

Hermann Reif, bookseller and stationer, Detroit, Mich., has sold out to Geo. Schwenk.

Ben. L. Darrow, publisher, Indianapolis, Ind., has been succeeded by the Wheelman Company.

J. A. Crawford & Co., booksellers and stationers, Manistee, Mich., have sold out to Somerville & Wood.

A new wall paper, &c., store has been opened by Logan & Macdonald at Newburgh, N. Y.

Miller & Middleton, dealers in wall paper, Grand Rapids, Mich., have been succeeded by G. N. Miller & Brother.

Julius Kallmey, dealer in wall paper, Brenham, Tex., has sold out to E. Penker, who will continue the business at the old stand.

The Ennis Stationery Company, St. Louis, Mo., successor to the R. & T. A. Ennis Stationery Company, which failed in January, has been incorporated by Anthony F. Hahn, president; George T. Dunn, secretary; H. R. Rehme, treasurer, and Fred.

S. Holton, Joseph W. Rall, Ed. T. Bridge and John G. Rotermund. Capital stock, $30,000, of which amount 75 per cent. has been paid in. All of the members of this company, except H. R. Rehme, were in the employ of the R. & T. A. Ennis Stationery Company.

The *Star*, Toronto, Ont., has been incorporated by E. E. Sheppard, Fred. Nicholls, R. Butchart, W. S. Andrews and George F. Madden. Capital stock, $75,000.

J. Weaver & Co., stationers and wholesale paper dealers, Grand Rapids, Mich., have taken Harry H. Burr, of Detroit, into copartnership, the style of the new firm being Holmes & Burr. W. F. Holmes, the senior partner, has been the de facto owner and manager of the business.

Alfred Peats, dealer in wall paper, Chicago, Ill., will open a branch establishment at Quincy, Ill., under the management of Fred. W. Resch

The Hamilton *Templar*, Hamilton, Ont., has been incorporated by F. W. Watkins, W. W. Buchanan, G. H. Lees, J. H. Land, W. Southam, J. H. Tilder and T. W. Watkins.

The United States *Building News* Company, New York city, has been incorporated. Capital stock, $20,000; and directors, C. W. Sweet and F. W. Creesy, of New York city, and H. W. Desmond, of Cranford, N. J.

The *Southwestern Manufacturer*, Kansas City, Mo., is a new monthly paper published by the Southwestern Publishing Company.

A receiver has been appointed for the Globe Paper and Fibre Company, Brownville, N. Y.

The plant of the *Leader*, Amherstburg, Ont., has been purchased by F. H. Macpherson.

The Empire Printing and Publishing Company, Halifax, N. S., has applied for incorporation.

The Kansas City *Times* Newspaper Company, Kansas City, Mo., has been succeeded by the *Times* Publishing Company.

The *News* Publishing Company, Vernon, B. C., was dissolved on February 1. W. J. Harber retiring. The business will be continued by J. A. McKelvie, G. G. Henderson and Price Ellison.

The *Reporter*, Galt, Ont., has been purchased by Thomas Sears and C. E. Knowles, proprietors of the Preston (Ont.) *Progress*.

A. J. Matheson, proprietor of the *Expositor*, Perth, Ont., has sold out to Charles F. Stone.

Green & Rice, publishers of the *State Democrat*, Brownsville, Tenn., have been succeeded by Rice & King.

Edwin Ives, bookbinder, New York, has admitted his sons, Edwin S. Ives and John N. Ives, to partnership under the style of Edwin Ives & Sons.

The International Law Publishing Company, of New York, has been incorporated. Capital, $5,000; directors, J. C. Krause and Daniel Weaver, of New York city, and L. W. Lake, of Passaic, N. J.

The *Record and Guide* Printing Company, of New York city, has been incorporated with a capital of $20,000. The directors are Charles J. O'Brien, C. W. Sweet and James E. O'Hara, of New York, and H. W. Desmond, of Cranford, N. J.

The incorporators of the Dansville Pulp and Paper Company, Dansville, N. Y., are Junius B. Van Duzee, Dansville; Edward S. Hull, Jr., William H. Romer and M. Baxter, Jr., New York, and William Ayers, Jr., Elizabeth.

The *Law List* Publishing Company, New York, has been incorporated. Capital stock, $5,000; and directors, Chas. F. Schneider, of Chicago; V. B. Baggot, of New York city; G. C. Franciscus, of Philadelphia; A. K. Amacher, of New Orleans; A. L. Abbott, of St. Louis; J. B. Kelley, of Cincinnati; J. A. Cavanagh, of Omaha, and Frank Gibbons, of Buffalo.

Failures.

The Martin Press, printer, Chicago, Ill., has made an assignment.

The Presbyterian Printing and Publishing Company, Limited, Toronto, Ont., has called a meeting of its creditors.

The Brown Book and Stationery Company, Kansas City, Mo., has made an assignment. On February 1 it claimed assets, $57,857; liabilities, $32,999.

The officials and assignees of the Bangor Pulp and Paper Company, Orono, Me., are said to be preparing for a settlement and continuation of the business. Great excitement has prevailed among the employees as to the prospects for settlement, but they have been assured that a plan is on foot to conserve the interests of the company's creditors, and also to allow the business to be continued. The forced stoppage of the company's plant for the season consequent upon the explosion in 1893, as well as the expense of reorganization, raising of the capitalization and the rent, which is reckoned on a percentage basis on the capital stock, were seen, when too late, to be a mistake.

C. L. Van Reed, paper manufacturer, Reading, Pa., has failed. His liabilities consist of mortgages, $12,000; unsecured book accounts, $5,500, and a $10,400 execution, making a total of $27,900. Mr. Van Reed's property consists of a paper mill on the Tulpehocken, 4 miles above Reading; a farm of 80 acres, five dwelling houses, situated near the mill, and the stock in his paper store at 12 South Fifth street. The failure is attributed largely to dullness in trade and inability to compete with larger mills, as well as to adverse circumstances, Mr. Van Reed having suffered loss at his mill through fire and flood.

West, Johnston & Co., stationers, Richmond, Va., have made an assignment to Charles A. Rose, who later was also appointed receiver. The firm failed last June, and settled at 33⅓ cents on the dollar, 15 cents being paid in cash and 18⅓ cents to be paid in five monthly parts, beginning in October. The concern defaulted on its time payments and has been under further extension. The present liabilities are about $10,000, and the creditors are classified as follows: First, the expenses incurred in executing the trust, Montague & Dawson, $351, and proper fee for further legal services, wages, rent, &c. Second, Bettie D. Powell, $350; L. Ginter, $1,000; L. C. Gillespie, $1,800; estate of John M. West, $957.46; Joseph Bryan, $400; Planters' National Bank, $300; G. H., C. G. and E. A. Baughman, $50; George M. West, $1,048; R. A. Taylor, $48.50; Rev. J. Y. Downman, $35; estate of Thomas Johnston, $473.02; Joseph A. Johnston, $30; George F. Brown, $75; holder of a certain note, $35; Anderson Brothers, $157.15; Ginn & Co., $278.29, subject to credit of $129.50; Charles A. Rose, $105. Third, American Book Company, $2,358.46, D. C. Heath & Co., $88.14; Baughman Stationery Company, $62; Stationers' Board of Trade, trustee, $1,000. Fourth, all other creditors.

Fires.

William Quane, printer, San Francisco, Cal., has had a loss by fire.

The *Courier* printing office, Scranton, Pa., was burned out March 5.

The *Banner-Messenger*, Florence, S. C., has had an estimated fire loss of $3,500; partly insured.

The *Ledger* Publishing Company, Mechanic Falls, Me., was damaged by fire on February 27. Loss, $300; insurance, $2,000.

The Brenack Paper Company, dealer in paper and paper bags, 120 Chambers street and 50 Warren street, New York, was damaged by fire on March 1. Loss, $2,000.

The bagging factory of Peter Young, Long Island City, N. Y., was burned on March 5. The loss is estimated at $200,000; insurance, $70,000. The fire broke out in the engine house.

The *Daily Democrat* and H. M. Benshoff's bookbindery and printing office, Johnstown, Pa., were burned out on March 5. The losses were, *Democrat*, $15,000, insurance $4,000; Benshoff, $5,000, insurance unknown.

Mortgages, Etc.

[In the appended list R. signifies a renewal of a pre-existing mortgage; B. S., bill of sale; T. D. trust deed, and Real, a mortgage on real estate.]

EASTERN STATES.

Mortgagor.	*Amount.*
Waterman & Wright, Hartford, Conn.	$354
Frank M. Yerrington, Boston, Mass.	1,500
H. D. Campbell & Co., Cambridgeport, Mass.	299

MIDDLE STATES.

J. E. Hullfish, Lawrenceville, N. J.	400
Apgar & Decker, Newark, N. J.	100
Wm. J. Dingethal, New Brunswick, N. J.	100
Morris Lederman, Brooklyn, N. Y. (B. S.)	500
Julia A. Tanton (Mrs. W. H.), Utica, N. Y. (B. S.)	175

WESTERN STATES.

J. G. Rogers, Newton, Kan.	116
The Wilton-Smith Company, Detroit, Mich.	1
Wm. H. White, St. Paul, Minn.	400
Wm. P. Reehl, Cincinnati, Ohio	175
S. Koenigsberger, Deadwood, S. Dak. (Real).	5,500
A. C. Emerson, Ogden, Utah	1,000
J. L. Rohr, Milwaukee, Wis.	300

SOUTHERN STATES.

Edward & William Quielisch, St. Louis, Mo.	1,500

CANADA.

Gunning & Co., Halifax, N. S.	595

LIENS DISCHARGED.

John Flagg (John Flagg & Co.), San Bernardino, Cal. (Real)	1,000
Wm. Bartlett, Cambridge, Mass.	2,300
John Coombs, Charlottetown, P. E. I.	950

General Notes.

James Gordon Bennett has reduced the price of the New York *Evening Telegram* from 2 cents to 1 cent.

E. Rubovits & Co., printers and stationers, Chicago, Ill., are in the hands of a receiver. Assets, $43,000; liabilities, $25,000.

The Hastings Card Company, 26 Beekman street, New York, has opened a paper department in connection with its other business and will deal generally in paper.

The suit which Castle & Gottheil, paper stock importers, of this city, brought against the Springdale Paper Company, Westfield, Mass., has been settled out of court.

In the case of Angus D. Sawyer *v.* The Rumford Falls (Me.) Paper Company, being a suit for $10,000 damages, for injuries received by the plaintiff while in the employ of the defendants, the jury redenred a verdict of $4,250 damages for the plaintiff.

If your machine or engine room has a roof on which the water condenses and continually drops on the belts in such a manner that only rubber belting has been able to stand, try one of the new "Combination" belts. That is what they are for; they can be used where a rubber belt can, without actually running in water, and have the best qualities of rubber and leather in combination.

Market Review.

OFFICE OF THE PAPER TRADE JOURNAL, FRIDAY, March 6, 1896.

THE MONEY MARKET.—The stock market was very dull, and a majority of the moving shares closed at lower figures. Call loans on stock collateral were made at an average rate of 3@4 per cent., with a fair offering of funds. Offerings of money on time were again liberal and rates were easy, but demand was only moderate. Money is offered at 4½ per cent. for seven months on all dividend paying stocks. In the regular way the quotations are 4 per cent. for thirty to sixty days, 4½ per cent. for ninety days, 4½@5 per cent. for four to five, and 5 per cent. for six to seven months on good Stock Exchange collateral. For the best commercial paper the demand is moderate. Quotations are 5½@6 per cent. for sixty to ninety day indorsed bills receivable, 6 per cent. for four months' commission house and the same for prime four to six months' single names, while good paper having the same time to run is 6½@7 per cent. Brokers generally report that they are again accumulating a little paper. The foreign exchange market was quiet. Posted rates were $4.87½ for sixty days and $4.89 for sight. Actual rates were $4.86¼@4.87 for sixty days and $4.87¼@4.88 for sight.

THE PAPER TRADE.—The floods in the East have not only damaged mills, shut off product, and delayed correspondence, but they have crippled the railroads so that it is now a difficult matter to get supplies through. By the shutting down of mills a considerable product has been taken out of the market, and in the news branch of the trade this is felt with more force than in any other. There is a hunting about for supplies, and a good deal of energy is expended in getting stock to keep customers supplied in proper shape. Owing to the delay of the mails, there is a dearth of information from many points, except such meagre bits as may come by wire. In the way of failures this week's record is one, a small mill in Pennsylvania. The local market has not developed anything of special feature or interest.

JUTE BUTTS.—The market is quiet and unchanged. The March circular of Cabot, Ray & Co. gives the statistical position as follows: Imported to the United States, 1893, 331,738 bs; 1894, 228,765 bs.; 1895, 398,655 bs. Consumed in the United States in 1893, 368,336 bs.; 1894, 234,915 bs.; 1895, 396,355 bs. Stock on hand, New York and Boston, January 1, 1896, 2,300 bs. Imported, New York and Boston, January 1, 1896, 86,283 bs.; 1895, 42,513 bs.; 1894, 43,668 bs. Stock, New York and Boston, March 1, 1896, 2,300 bs.; 1895, 1,600 bs.; 1894, 4,392 bs. On passage for United States February 17, 1896, 167,741 bs., and by cable to February 29, 1896, none. Visible supply to July 1, 170,041 bs.; 1895, 280,483 bs.; 1894, 92,679 bs. Consumption since January 1, 86,283 bs.; 1895, 41,513 bs.; 1894, 45,426 bs. Delivered to consumers past 30 days, 52,601 bs.; 1895, 36,793 bs.; 1894, 44,276 bs. The same circular says: "Market in Calcutta strong, sales light. Market nominal at 1 1-16@1½ for shipments. Sailings for February, 16,000 bs. Deliveries to consumers for the month have been: To bagging manufacturers, 51,601 bs.; to paper manufacturers, 1,000 bs. Spot stock, 2,300 bs., paper quality. Supply to July 1: Paper quality, 30,729 bs.; owned by bagging manufacturers, 139,312 bs."

WOOD PULP.—Ground Wood is yet in demand, but the floods at various points have interfered with both shipments and production. The market remains high and firm.

WOOD FIBRE.—Fibre is in fair call. Bleached Soda is quoted at 1.80@2¼c. Domestic Sulphite is quoted at 1½@2¼c., as to quality, for Unbleached, and 3c. for Bleached. Foreign grades are quoted as follows: Unbleached Pine, soda process, 1¾@2¼c.; Bleached, same process, 2.30@3¼c.; Unbleached, sulphite process, 2.05@2.55c.; Bleached, do., 3@3¼c.; Bleached Straw Pulp, 3.80c. There were imported this week at New York 192 tons of Chemical Fibre, being 33 tons from Antwerp, 95 tons from Hamburg, 50 tons from Hull, and 14 tons from Rotterdam.

FOREIGN RAGS AND PAPER STOCK.—The business in the foreign rag market is small in volume, and consumers are only taking quantities sufficient for immediate wants. Imports aggregated 3,520 bales and 192 tons, being 1,989 bs. rags, 157 bs. papers, 192 tons chemical fibre and 1,374 bs. manillas. Ports of shipment and quantities are as follows: Antwerp, 211 bs. rags, 33 tons chemical fibre; Bremen, 29 bs. rags; Dundee, 430 bs. manillas; Glasgow, 78 bs. papers, 61 bs. manillas; Hamburg, 134 bs. rags, 95 tons chemical fibre, 53 bs. manillas; Havre, 118 bs. manillas; Hull, 555 bs. rags, 50 tons chemical fibre, 140 bs. manillas; Liverpool, 93 bs. rags, 393 bs. manillas; London, 79 bs. papers, 97 bs. manillas; Rotterdam, 14 tons chemical fibre; Stettin, 907 bs. rags, 85 bs. manillas.

DOMESTIC RAGS.—The domestic rag market is quiet, the demand being light. Prices remain about as they have been.

BAGGING, &c.—The market for Gunny Bagging is very quiet and as a rule consumers do not show any interest in the situation. We note sale of 100 tons to arrive at 75c., as also of 25 tons No. 1 mixed on spot at 65c. Manilla imports for the week aggregated 1,374 bales, being 430 bs. from Dundee, 61 bs. from Glasgow, 50 bs. from Hamburg, 118 bs. from Havre, 140 bs. from Hull, 393 bs. from Liverpool, 97 bs. from London, and 85 bs. from Stettin.

OLD PAPERS.—There is a moderate movement of the lower grades of stock. We quote: No. 1 Hard White Shavings, 2.15@2½c.; No. 1 Soft White do., strictly free from wood, 1.60c.; Soft White do., ordinary, 1¼c.; Old Ledgers, 1¾c.; Solid Printed Books, 1¼c.; Mixed Shavings, No. 1, 1@1¾c.; Mixed Shavings, No. 2, ¾c.; Extra No. 1 Manillas, 90c.; No. 1 Manillas, ordinary, 75c.; No. 2 Manillas, 60c.; Light Book Stock, 60c.; Folded News (overissues), 50@55c.; Mixed Papers, 35c.; Commons, 25@30c.; Straw Clippings, 45c.; Binders' do., 45c.

STRAW.—Trade is moderate and the market is steady. We quote: Long Rye at 75@95c.; Short Rye at 50@60c.; Wheat at 45@50c.; Oat at 50@55c.

ROSINS.—Low grades are strong, and small sales have been made at slight advance. We quote: Common to Good Strained, $1.95@2; E, $2.02½; F, $2.05; G, $2.10; H, $2.15@2.17½; I, $2.25; K, $2.40; M, $2.60; N, $2.70; W. G., $2.80.

CHEMICALS.—The market for paper makers' chemicals continues quiet. Under date of February 18 J. P. Brunner & Co. speak of the Liverpool market as follows: "Although the market for chemicals is still rather lifeless as far as fresh orders are concerned, makers report rather freer deliveries against contracts. Sulphate of copper is in a strong position and firm at £16 15s., with little offering for prompt or March delivery. Soda Ash shows light improvement in deliveries against contracts, but fresh business is very limited. We quote spot range for tierces as follows: Leblanc Ash, 48 per cent., £4 to £4 5s. per ton; 58 per cent., £4 5s. to £4 10s. per ton; Ammonia Ash, 48 per cent., £3 7s. 6d. to £3 12s. 6d. per ton; 58 per cent., £3 12s. 6d. to £3 15s. per ton, net cash; bags, 5s. less. Soda Crystals in fair request, but not active; quotations are steady at £2 7s. 6d. to £2 10s. per ton, less 5 per cent. for barrels, and 7s. less for bags. Caustic Soda in small compass, especially for outside makes. We quote spot range: 60 per cent., £6 5s. to £6 12s. 6d. per ton; 70 per cent., £7 5s. to £7 12s. 6d. per ton; 74 per cent., £8 5s. to £8 10s. per ton; 76 per cent., £9 5s. to £9 10s. per ton, net cash. Bleaching Powder slow of sale, but quotations are nominally unchanged, ranging from £7 5s. to £7 10s. per ton, net cash, for hardwood packages, according to destination." Under date of February 19 Peter R. McQuie & Son speak of the same market as follows: "We have again to report a quiet market for chemicals, prices of which remain very much as last quoted, Bleaching Powder, however, being rather more in buyers' favor. There has been a fair demand for Caustic Soda, but Ammonia Alkali has been neglected. Chlorate of Potash has not received the attention that the late advance led the trade to expect, and there are resellers at a shade under makers' figures. Business generally has improved, and it is to be hoped that chemicals (which formerly were considered the index to any development in commerce) will eventually share in the movement. We quote to-day: Bleaching Powder, hardwood, £7 2s. 6d. to £7 5s. per ton; Caustic Soda, 60 per cent., £6 10s. per ton; 70 per cent., £7 10s. per ton; 74 per cent., £8 10s. per ton; 76 per cent., £9 5s. per ton; Soda Ash, Leblanc, 48 per cent., £4 7s. 6d. per ton in casks; 58 per cent., £4 12s. 6d. per ton; Ammonia, 48 per cent., £3 10s. per ton, f. o. b., casks; 58 per cent., £3 15s. per ton; bags, 5s. per ton less; barrels, 5s. to 10s. per ton extra. Special terms offered for U. S. A. Soda Crystals, £2 7s. 6d. to £2 10s. per ton." In the local market Bleaching Powder is quiet and most of the business being done is the filling of contracts. Alkali is in very slow movement, and the inquiry for Caustic Soda is small. During the week there have been sales of Bleach at 1.80@—; Soda Ash at 1¾c.; Soda Caustic, 2.20@2¼c., and Alkali at .90@1c.

CHINA CLAY.—The movement is still restricted to supplying the current needs of consumption, and although arrivals have been light there seems to be plenty of stock with which to meet the present requirements of consumption. Prices are unchanged at $11@18 for English, and $8@10 for domestic, according to quality and size of order.

TWINES.—There is a fair business in progress. We quote: Sisal Hay Rope, 5½c.; Sisal Lath Yarn, 5c.; Jute Ready, 5@6c. Twines — Jute, 18, 10½@11c.; 24, 10@10½c.; 36, 9@9½c.; Jute and Hemp, 18, 13@14c.; 24, 12½@13½c.; 36, 12@13c.; Hemp, 18, 16c.; 24, 15½c.; 36, 15c.; Marlines, Jute, 4½, 9c.; 6, 8½c.; 8, 7½c.; Jute and Hemp, 6, 11c.; 8, 9c.; American Hemp, 4½, 14c.; 6, 13c.; 8, 12c.; Russian Hemp, 4½, 14c.; 6, 13c.; 8, 12c.

COAL.—There is nothing new in the coal market, business going along steadily under the guidance of the combination in each branch of the trade.

EDWIN BUTTERWORTH & CO.,
MANCHESTER, ENGLAND,
PACKERS OF ALL KINDS OF
Paper Stock, Cotton Waste and Buffalo Sizing, Wood Pulp, Moist and Air Dry Pulp, Soda and Ground Pulp,
P 83 GUNNY BAGGING, &c.
OFFICE IN NEW YORK:
Vanderbilt Building, No. 132 Nassau Street.
JAMES FIRNIE, A. S. DEMAREST, } Managers.
Branch Office at Boston: 58 Federal Street,
C. H. WOOD, Manager.

WATERBURY
Felts and Jackets.
MANUFACTURED BY
H. WATERBURY & SONS CO.,
ORISKANY, N. Y.
Adapted to *every* grade of paper from the *finest* to the *coarsest*.
The Largest Manufacturers of Paper Makers' Felts in the World.
Our wet machine or pulp felts are *unequaled* for *durability*.
For WRITING and LEDGER PAPERS We warrant a felt equal to anything imported.

PRICES CURRENT.

NEW YORK MARKET.

Paper Market.

DEALERS' SELLING PRICES.

Ledger and Record	$0.16	@	$0.21
Flat Caps, superfines	11½	@	14
Flat Caps, fines	11	@	13
Flat Caps, engine sized	7	@	9
Blotting, American	8	@	12
Blotting, English	17	@	....
Book, super sized and calendered	5	@	8
Book, super sized and tinted	5	@	8
Book, extra machine finish	5	@	....
Book, machine finish, low grade	4½	@	5
News	3¼	@	3
Poster	3	@	....
Hanging, superfine, No. 1	8	@	10
Hanging, superfine, No. 2	6	@	8
Hanging, machine satin	4	@	4½
Hanging, white blank, No. 1	4	@	4½
Hanging, curtain	3½	@	4
Hanging, brown	2½	@	3
Colored papers, double mediums	6½	@	8
Colored papers, glazed medium	7½	@	8½
Colored papers, tobacco	8½	@	9½
Colored papers, tissues, 20×30, ₱ ream	1.10	@	1.35
Tissues, black, 20×30, ₱ ream	1.40	@	1.50
White tissue, 20×30, ₱ ream	60	@	80
Manillas, Flour sack, cream	10½	@	....
Manillas, Flour sack, drab	9½	@	11
Manillas, Rope, unbleached No. 1	9½	@	11
Manillas, Rope, unbleached No. 2	7½	@	9
Manillas, No. 1, light weight	6½	@	6¾
Manillas, No. 1, heavy weight	6¾	@	6¾
Manillas, No. 2	5	@	6
Manillas, Bogus	2¾	@	3¼
Wrapping Parchment	16	@	....
Tissue Manillas, full count, weight and size, 24×36, other sizes in proportion	55	@	60
Hardware, light colored, No. 1	4½	@	....
Hardware, No. 1, glazed, tarred	4½	@	....
Hardware, No. 1, glazed	4	@	....
Binders' Boards, ₱ ton, No. 1	70.00	@	90.00
Binders' Boards, ₱ ton, No. 2	30.00	@	40.00
Strawboards, air dried, No. 1, ₱ ton	40.00	@	....
Strawboards, steam dried, No. 1, ₱ ton f. o. b. mill	....	@	....
Straw Wrapping, basis, 15×20, 15½ lbs., 20 sheets—			
36×40, from 38 to 42 lbs. ₱ rm	65	@	....
30×40, from 30 to 34 lbs. ₱ rm	....	@	52
24×36, from 24 to 26 lbs. ₱ rm	....	@	48
22×32, from 24 to 26 lbs. ₱ rm	45	@	....
20×30, 21 lbs., ₱ rm	....	@	34
20×30, from 14 to 17 lbs. ₱ rm	26	@	....
16×22, from 12 to 13 lbs. ₱ rm	23	@	....
18×28	....	@	24
15×20, 10 lbs. ₱ rm	....	@	17
15×20, from 7 to 8½ lbs. ₱ rm	....	@	13
14×18	....	@	12
12×16	....	@	11
11×15	....	@	10
Straw Wrapping, ₱ lb., heavy weight	1.75	@	1.85
Straw Wrapping, ₱ lb., light weight	1¾	@	....
Cigarette, Straw Tissue, per case of 100 boxes, 50 books to the box, 200 sheets to the book	21.00	@	30.00
Tea Papers, 16 sheet quires—			
12×18	....	@	14
14×20	....	@	18
Card Middles, ground wood	5½	@	6¼
Card Middles, long fibre wood	8½	@	9
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Pulp Lined Boards, single manilla, No. 100 and heavier	42.50	@	....
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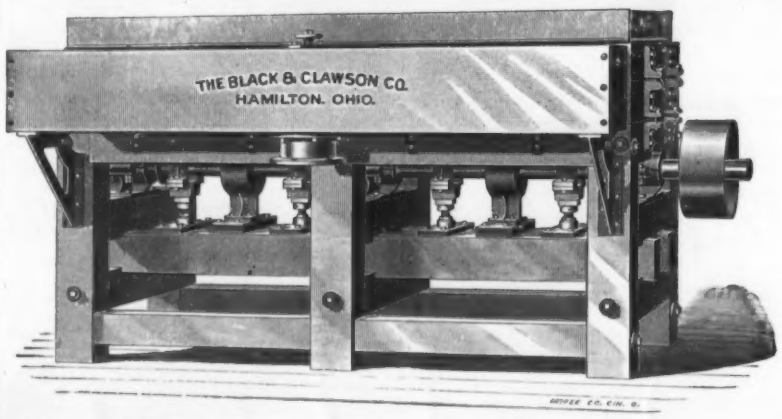

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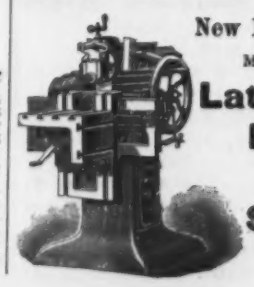

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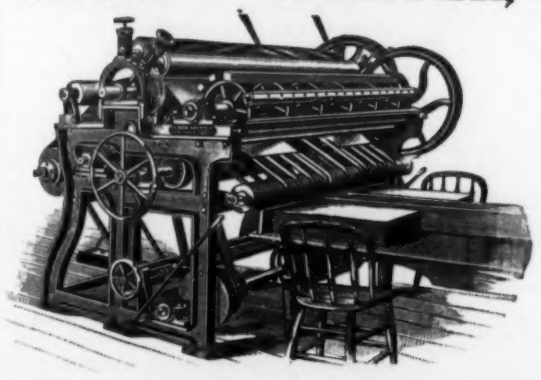

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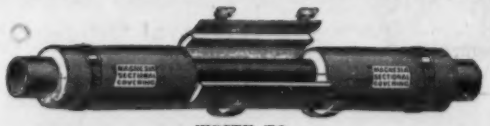

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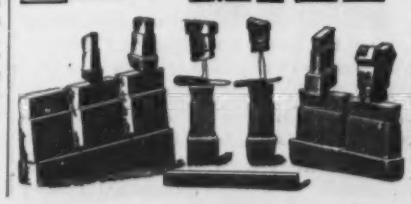

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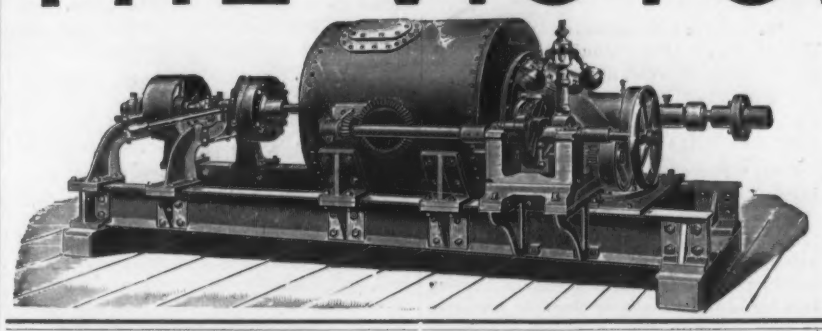

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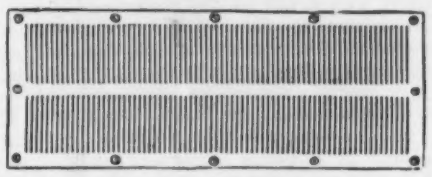

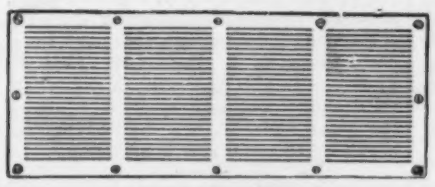

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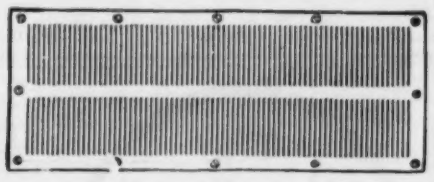

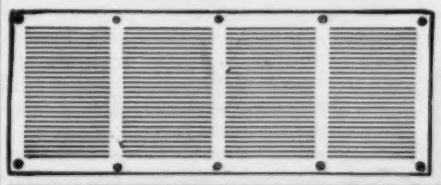

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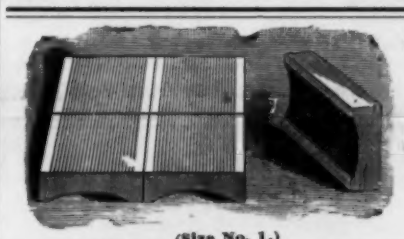

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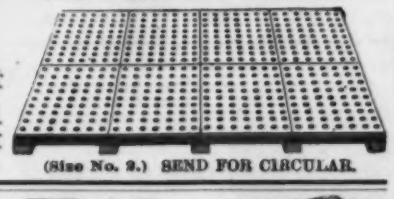

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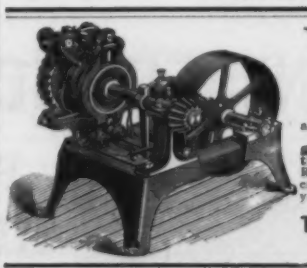

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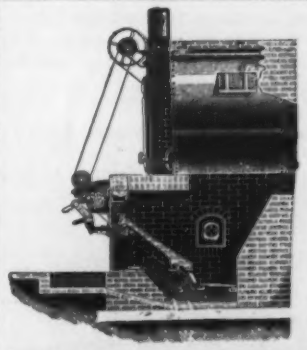

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Manufacturing News.

EASTERN STATES.

The plant of the Androscoggin Pulp Company, Brunswick, Me., was flooded with water during the recent freshet.

The mill of the Lisbon Falls Fibre Company, Lisbon Falls, Me., was damaged by the freshet.

The new 30 foot stone addition to the Fairfield Paper Company's dam, Fairfield, Mass., was washed away on March 2.

The pulp mill of Alvin Record, Livermore Falls, Me., was broken in two by the ice jam this week. The damage will amount to about $25,000.

The Otis Falls Pulp Company's plant at Livermore Falls, Me., has been damaged about $10,000 by water.

It is reported that the Pejepscot Paper Company, Brunswick, Me., will lose about $120,000 by the carrying away of logs and injuries to its dam by the freshet this week. In the grinding room the water stood 11 feet deep.

The loss of logs by S. D. Warren & Co., Cumberland Mills, Me., in the recent flood was large. They were carried by the water down the river and scattered along on both sides of Caseo Bay. Some were found out as far as Portland Head.

Five of the piers at the mill of the Fall Mountain Paper Company, Bellows Falls, Vt., were swept away by the floods, causing a loss of $5,000. The lower part of the mills was inundated, and at one time there was much danger of more serious damage by threatening ice.

A part of the foundation of the paper mill of the P. C. Cheney Company at Manchester, N. H., was washed away by the flood in the Merrimac River.

The bridge connecting with the mainland the island on which are the mills of the Bowdoin Paper Manufacturing Company, Brunswick, Me., was completely swept away in the late freshet. The company's mill was closed down for a while in consequence.

Probably the heaviest losers by the recent flood in the New England States were S. D. Warren & Co., Cumberland Mills, Me., whose mills are situated on the banks of the Presumpscot River. Early in the morning of March 2 the centre of the bridge of the Maine Central Railroad Company, against which acres of broken ice had been pressing, gave way under the strain and came against the iron highway bridge just above the company's plant like a battering ram, carrying everything before it. All of this mass was then swept against the "'95 mill," so called, and which extends across the river, knocking a large hole in the side and otherwise injuring it. Behind this mill is "mill '93," against which the trusses of the bridge and other débris were piled up. The machinery in this mill was much damaged by the fire. The stock, including hundreds of barrels of lime, was also much injured. The tramway bridge was washed away and the gate house, costing $40,000, and the power house which furnished the light for the mills and the city of Deering were carried away. The loss is figured at about $250,000. A part of the plant has since been started up; a temporary tramway has been built, and large crews of men have been working day and night clearing away the débris.

Two days after the flood at Livermore Falls, Me., the water had subsided enough to allow several paper plants to continue manufacturing.

It is said that the destruction of bridges in the New England States by the floods was unprecedented. In Maine alone over one hundred bridges were swept away. One report states that when all accounts are in the total, including large and small bridges, will amount to nearly two hundred. Many of them were owned or used extensively by paper mills which will be seriously hampered in their operations until they are replaced. The loss in this direction alone will approximate $200,000.

It is reported that a new paper mill is to be built this year at Lincoln, Me., as a syndicate has been prospecting there and bonding lands.

The Jay Paper Manufacturing Company, Jay, Me., turned out 1,295 tons of paper during the month of January.

A leatheroid paper mill is under construction at Kennebunk, Me.

Foundations are to be laid at an early date for a new pulp mill at Otis Falls, Me., on the Androscoggin River.

The Berlin Iron Bridge Company, of East Berlin, Conn., has just completed for the Citizens' Gas Company at Bridgeport, Conn., two large buildings—one 68 feet wide by 171 feet long, comprising a purifier house, a meter house and valve house, and the second building, 44 feet wide by 122 feet long, comprising a generator house, a scrubber house and engine room. The side walls are of brick and the roof trusses are of steel covered with corrugated iron.

The improved machine now in use at the Glen Manufacturing Company's mill, Berlin Falls, N. H., is running 350 feet of paper a minute, and is expected to be geared up to 400 feet. The second machine is now being improved for greater production.

The Compressed Paper Box Company, Bridgeport, Conn., owing to increasing business has raised its factory building another story.

The sluiceway which the Winnipiseogee Paper Company, Franklin, N. H., has constructed down the mountain side in the Pemigewasset Valley at an expense of $800 for the purpose of handling logs has proved a success, except that the logs move so rapidly that at times it has been found difficult to keep them in the sluice. To avoid trouble in this direction the speedway is being covered.

A new engine has been set up at the mill of the Wheelwright Paper Company, North Leominster, Mass.

The mills of the Chelsea Paper Manufacturing Company and the A. H. Hubbard Company, Greenville, Conn., were temporarily shut down by reason of high water this week. Back water in the Chelsea mill on Sunday made it necessary to cut the main belt and take it off in order to save it from injury. The belt was repaired on Monday by the Norwich Belt Company and the mill started up on Tuesday morning, the fine filtering plant of the company rendering it unnecessary to stop on account of dirty water.

The mill of the Jay Paper Manufacturing Company, Jay, Me., which was shut down owing to the flood, was to have been started yesterday.

The Nashua River Paper Company, East Pepperell, Mass., was flooded and has been shut down all this week. It was expected that the mill would be started today.

At Lawrence, Mass., the Russell Paper Company was flooded, the water rising an inch higher than it did last year.

MIDDLE STATES.

Water reached the highest point ever known at Ballston Spa, N. Y., during the recent flood, causing the dams of several mills to be carried away. Among them was that of George West's Eagle Paper Mills. The loss to this company is estimated, it is stated, at more than $50,000, while the general damage to property amounts to about $150,000.

Several large paper machines are being built at the shops of the Pusey & Jones Company, Wilmington, Del. This company shipped on February 25 a carload of machinery to the Hudson River Paper Company, Corinth, N. Y.

Mr. Pearson, of the Lambertville Paper Company, has bought the Great Spring paper mill at New Hope, Pa., and will run it on tissue. He has already placed the product.

Dorlan's Mill, near Downingtown, Pa., the property of Maxwell Clower and B. G. Nichols, is receiving a large addition. The new firm has been quite successful and has now fourteen men at work.

Hovey, Clark & Co., Bainbridge, N. Y., are reported to have entered into a contract to supply the Fall Mountain Paper Company, Bellows Falls, Vt., with milk sufficient for the manufacture of 120 pounds of milk powder. Is the paper company going into caseine sizing?

George Halbert, wall paper printer, Brooklyn, N. Y., has enlarged his factory and intends to put in more machinery.

The new digester at the pulp mill of the J. & J. Rogers Company, Ausable Forks, N. Y., has begun operations, and about 40 cords of wood extra per diem are required.

The State Land Board has denied the application of the Thomson Pulp and Paper Company, Thomson's Mills, N. Y., controlled by Hon. Lemon Thomson and John A. Dix, of Albany, for a grant of land under water in the vicinity of its mills on the Hudson River, in Washington County, on the ground that the land would be needed for the purpose of enlarging the Champlain Canal.

It is proposed to establish two mills at Upland, Pa., for the manufacture of waterproof utensils of wood fibre.

It is reported that the dam at Hannawa Falls, N. Y., is to be raised and a pulp mill built there in the spring.

Patrick Farrelly, New York, has sold the Eden Tissue Mills, Whippany, N. J., to H. C. Raynolds, formerly connected with these mills. The plant is one of the most extensive of its kind, comprising four mill buildings of brick, eight dwelling houses, two barns and a machine shop, on 102 acres of land, through which runs the Whippany River, with a fall on the property of 28 feet, generating 200 horse power. The celebrated Eden Springs are situated on this property, flowing a large supply of pure water, specially adapted for use in making high grade tissues. Mr. Raynolds will organize a company at once, which will put the mill in thorough repair and continue the manufacture of tissue papers.

The Reading Paper Box Company, Reading, Pa., has elected the following named officers: President, J. E. Wanner; vice-president, Frank S. Livingood; secretary and treasurer, Geo. A. Manner; manager, C. M. Steinmetz; directors, J. E. Wanner, C. M. Steinmetz and Louis F. Kramer.

WESTERN STATES.

The Ashland Sulphite Fibre Company, Ashland, Wis., has added to its plant three more acid towers, one more 100 horse power boiler, another 150 horse power engine, one pulp screen and two sulphur ovens. Five carloads of machinery and ten cars of foundation stone have been shipped there from Appleton, and now it is expected that the plant will be making pulp by April.

A paper box factory has been started at Racine, Wis., by A. Michelson, recently foreman of the *Times* job room of that city.

John Strange, the paper manufacturer of Menasha, Wis., who has been projecting a paper mill at Sauk Rapids, Minn., now states that owing to the depressed financial condition of the country the men who had agreed to form the $500,000 company for mill and dam improvements are loath to invest at this time. He requests more time in which to push the undertaking.

The Appleton Wire Works are a new undertaking at Appleton, Wis., for the purpose of manufacturing Fourdrinier wires, dandy rolls and other paper mill supplies. The officers are: Manager, William Buchanan, who for fourteen years was in charge of the Fourdrinier wire cloth department at the Cheney-Bigelow Wire Works, Springfield, Mass.; superintendent, Albert B. Weissenborn, a former employee of the same concern; secretary and treasurer, Gustavus E. Buchanan. John R. Buchanan is also financially interested in the company and will represent it among the paper mills. A new mill, 35x100, has been erected and is now in operation.

SOUTHERN STATES.

John Hill has purchased the lands and water rights of the Rock Island Paper Mill on the Chattahoochee River above Columbus, Ga. The property includes 147 acres of land in Alabama and a large island of stone across the river in Georgia, consisting of about 5 acres. A spindle mill is to be erected on the property.

CANADA.

It is reported that a pulp mill will be erected in the spring on the Sissibro River, Digby County, N. S. Large quantities of pulp wood are available.

The Masterman Pulp Mill, located at Mill Cove, on the Miramichi River, N. B., which is being built at an expenditure of $100,000, is composed of seven large buildings. The digester building is 84x32 feet and 90 feet high; the storeroom is 100x50, and the paper mill rooms adjoining are 50x150, while to the rear of these are the engine and boiler buildings 40x100 in extent. There are two other buildings through which the pulp passes in different stages of manufacture, and a large digester building, 84x32, with a tank house 30x84 adjoining, which last connects with the river by a slip 240 feet long. This mill will turn out 30 tons of dry pulp per diem and expects to give employment to about seventy hands.

The Maritime Sulphite Fibre Company, Chatham, N. B., is giving its mill a thorough overhauling and putting in more machinery.

J. C. Wilson & Co. are putting in another grinder at their mill at St. Jerome, Que., and are building a new dam preparatory to the erection of a large wood pulp mill.

The dam of the Canada Paper Company, Windsor Mills, Que., is now complete, and the electric portion of the work is well under way. It is proposed to generate 1,000 horse power and to operate the entire factory either by electricity entirely or in conjunction with local water wheels. The building and yard are to be illuminated by a large number of arc and incandescent lamps. An electric railway will be used for the freighting of pulp to factories and railway stations.

Obituary.

GAVAN J. MOFFATT.

Gavan J. Moffatt, a well-known paper bag manufacturer, died at his home in New Haven, Conn., on February 29, of dropsy, after an illness of three weeks. He was born in Adria, Scotland, in 1839, and was fifty-seven years old. At the age of ten years he came to this country with his parents and resided for a number of years in New York city, where he learned his trade as a paper bag maker. He afterward went to Washington, D. C., and engaged in the bag business and then removed to Port Chester, N. Y., where he established his present business. He removed it to New Haven in 1871 and located in the Atwater Building, at the junction of Grand avenue and St. John street. Later he moved into the building on State street at the foot of Elm, where the concern is now located.

Mr. Moffatt married Jennie Smith, by whom he had three children, William J. and Guy J., who are interested in his business, and Alice, who died several years ago. Mr. Moffatt was a man of genial temperament and had a large number of friends. He was a good business

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"Best and Most Economical Made."

Wise Paper Makers

don't always want to buy high priced imported Felts, nor do they want to experiment with inferior grades of domestic ones. The "Hamilton" answers their requirements in every respect.

In ordering, mention kind of stock used, quality of paper made and speed of machine.

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Ventilating Fans,
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THE GENERAL FIRE EXTINGUISHER COMPANY,
CONTROLLING THE INVENTIONS AND APPARATUS
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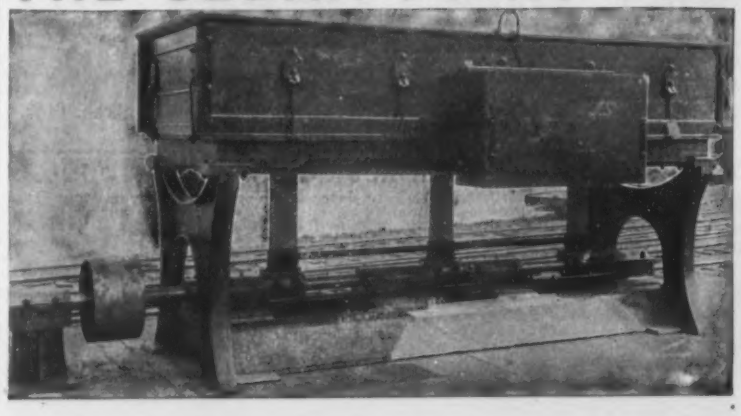
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PAPER AND PULP
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Made in three sizes: 8, 9 and 10 Plates.
IMPROVED WET MACHINES.
Three-Pocket Wood Pulp Grinders.
The Only Builders of a Steam
"DRAG SAW."
GATE AND PRESSURE VALVES A SPECIALTY.
FIVE-WAY OR DOUBLE PRESSURE GRINDER VALVES A SPECIALTY.
Send for Blue Prints. Orders promptly filled.

man, and by care and attention had succeeded in building up a large trade in paper bags and stationery. He was a member of Trumbull Lodge of Masons and the Monticello Club.

JOHN DEMPSEY.

John Dempsey, of Dempsey & Carroll, stationers, New York, died on March 2 at his residence, 153 West Seventy-first street, of pneumonia, after a sickness of two weeks.

Mr. Dempsey was born in New York in 1830, and was by trade a steel and copper plate engraver. In 1878 he formed a partnership with George D. Carroll and began business as Dempsey & Carroll in the engraving and stationery business on Fourteenth street, between Broadway and University place, he being also connected with the Union Square Printing Company, which was located at the same place. The stationery business prospered, is now incorporated, and is located at present at Fourteenth street and University place.

Mr. Dempsey was a quiet, unpretending, genial man, who thoroughly understood his chosen line of work. He leaves a widow and four daughters.

Mark Gordon, whose skull was fractured some weeks ago by the bursting of one of the grinders at the pulp mill at Sault Ste. Marie, Ont., and who was getting on apparently very nicely, died on Thursday, February 27, brain fever having set in. His body was sent on Friday morning to Barry, Vt., by rail, to his former home. The greatest care and attention was bestowed upon Gordon during his sickness by the pulp and paper company and by Dr. Hunter.

W. P. Cook died on February 20 at his home in Englewood, Ill. Mr. Cook, who was a native of New York, removed early in life to Ohio, and in 1854 engaged in the stationery business at Geneseo, Ill., remaining in active business until two years ago. He was at one time mayor of Geneseo. As a business man his record was splendid, and he died leaving his three children a good competence.

Charles McK. Leoser, publisher, New York city, is dead.

Accidents.

Charles Irish, a machine tender in a paper mill at Sandy Hill, N. Y., was instantly killed on Thursday morning while attempting to place a belt on a machine. His neck was broken.

Frank Dillman was caught in the shafting at W. C. Hamilton & Sons' Riverside Mills, Lafayette Station, Pa., on February 27, and escaped with a compound fracture of the left arm.

Howard G. Jones, an employee in the Susquehanna Water Power and Paper Company's mill, Conowingo, Md., met with a serious and probably fatal accident recently. He was at work on a ladder on the top floor of the sulphite mill, when he slipped and fell through a hole in the floor to the ground floor, a distance of 35 feet. His head and shoulders struck on a bed of hard pulp, and he remained in an unconscious condition for twenty-four hours. He was taken to his home in Dublin, Md.

John O'Day, a workman in the mill of the H. W. Johns Manufacturing Company, Brooklyn, L. I., was caught in the belting while at work on March 5, and whirled around the shaft. A fellow workman, William Sands, sprang to the rescue, and wrenching O'Day free, dropped him upon the floor. Then staggering forward to save himself from falling, he, in his turn, unconsciously grasped the belt, and in an instant was drawn upward, striking the beam and rafters repeatedly. As soon as possible the machinery was stopped, when the poor fellow dropped unconscious by the side of O'Day. The first words which he spoke on recovering momentary consciousness were addressed to O'Day: 'Are you all right, Jack?" He was again unconscious when the surgeon arrived, and both men were taken to the Brooklyn Hospital. Sands' arm and both legs were broken in several places, his skull was fractured, he was injured internally, and his body a mass of bruises. At 4 o'clock P. M. he died, his wife being with him. O'Day's injuries were not considered fatal. His shoulder was dislocated and his body much bruised, but he was able to be conveyed to his home in an ambulance.

A year ago Howard Lockwood & Co. adopted for the building of the Lockwood Press the Tucker automatic telephone system, putting in ten stations. It is simple in operation, and saves both time and labor, hence should be of service in mills, factories and all other large buildings. The first cost is reasonable, and the expense of keeping it in working order is nominal. For full particulars address the Tucker Electrical Construction Company, 14 to 20 Whitehall street, New York.

Water Gauge Glass Failures.

BY P. M. E.

One of the penalties we have to pay for availing ourselves of the advantages of higher steam pressures is represented by the increased risk of failure of boiler mounting and fittings; among these, probably that most seriously affected is the glass water gauge, for on every hand there is ample evidence of the trouble this indispensable boiler adjunct is causing, now that the steam pressures carried are in many cases double those employed a very few years since. That the trouble is a real one is evidenced by the large number of patents which have been applied for during the last few years for means for automatically closing the steam supply to the gauge glass in the event of the failure of the latter. Many of these devices have been placed on the market, but it cannot be said that they are an unmixed blessing, for in several arrangements it becomes almost an impossibility to clear the pipes forming the channels of communication between the boiler and the glass, and in this way it is easy to see that the remedy may easily become considerably worse than the evil it has been designed to overcome. In general the plan adopted in these safety gauge fittings is to provide a small ball valve in both top and bottom fitting, the balls lying normally in small nests or recesses, and more or less clear of the line of communication with the boiler. When the glass breaks the sudden outrush of steam and water impels these balls forward to the seats provided in the fitting, and in this way seal the outlet and prevent the further escape of steam and water. The writer's experience is that many of these fittings work well when new, and it is not a little startling to see the instantaneous sealing of the outlets by the balls when the glass is purposely fractured by the blow of a hammer. But, as will be readily understood, these balls may easily become a source of considerable trouble when the water is heavily impregnated with lime and other impurities; the deposit with which they are soon covered rendering them of very doubtful utility after a short time. Moreover, at best they never fulfil the requirements of an absolute safety appliance, since they cannot prevent the injury which too often results from the particles of the broken glass being blown in all directions. In several instances, notably on locomotives and steam tramway engines, the most severe injuries have been those inflicted on the fireman by the pieces of flying glass, and when failure has occurred, as it sometimes does, while the attendant is testing the gauge and is looking at the glass, loss of eyesight has resulted.

Quite recently a steam user in the North of England reported to his insurance company that during a period of thirty weeks he had to replace no less than 128 broken tubes, so that on an average a glass tube had to be renewed every one and three-quarter days. It is true that each of the twenty-six boilers here reported on had two glasses fitted, but taking due account of this and all other conditions of the case it is evident that there is something radically wrong either with the glasses themselves or the method of fixing. Another correspondent of the company complains in similar terms, stating that in the case of one boiler, working at 180 pounds pressure, no less than forty glasses have failed during nine months, or about an average of one per week. In this case the owners had tried four different makes of glass, but the result was uniformly bad. It was noticed that as a rule the whole glass was shivered to powder, but in a few instances some large pieces escaped, and these on examination were found to be worn very thin, especially at the upper part of the glass.

In considering the causes of these repeated failures, and, indeed, of gauge glass fracture generally, we may safely assert that one of the principal sources of trouble is the careless fixing of the fittings in the first place. It is scarcely reasonable to expect a glass to stand for any length of time if the fittings are out of alignment, and the gland nuts of the stuffing boxes do not work truly, so as to give an even pressure on the packing rings. The latter defect should certainly not be found in any but the very cheapest fittings—which are dear at any price—but to minimize the trouble caused in this way a conical ring of vulcanized rubber, provided at its upper end with a flange, on which the nut bears, is now being used in place of the ordinary packing rings. These rings prevent an undue pressure being brought on the glass, and at the same time allow sufficient elasticity to prevent the glass tube being strained.

Among other causes of gauge glass failures must be reckoned the effect produced by currents of cold air suddenly impinging on the glass. Also the cooling by radiation which occurs when the glass is fixed some distance from the boiler, and which causes the glass to crack when the gauge is being tested, or has hot water suddenly passed through it. In long boilers of the Lancashire and Cornish types the unequal expansion of the upper and lower burner parts of the shell may distort the front plate sufficiently to bring an unequal strain on the glass, but it seems scarcely likely that this cause alone would, under ordinary circumstances, be sufficient to cause fracture. Of course it may easily become a powerful contributory cause of failure, especially with some methods of fixing the gauge fittings. If we add to these the clumsiness of the fireman, both indirectly fracturing the glass and in careless testing, and also bad and often insufficiently annealed glass, we have a sufficiency of reasons for gauge glass fractures without taking into account the scouring action of high pressure steam in blowing through.

It is a good plan to keep a number of glasses in stock, and to thoroughly anneal them. This may be conveniently done by packing them in an iron box filled with sand, and gradually heated up to a temperature of from 300 to 400° Fahr.

But the only successful method of guarding against the accidents which are caused by bursting glasses is to provide exterior guards. The use of these has now become very general, and in a recent collection made by the Société Industrielle de Mulhouse of the different forms employed in France and Germany quite a variety of devices were exhibited. Of these the most crude are those consisting of a series of wires arranged parallel to and enveloping the glass, and spaced sufficiently apart to allow the water level to be seen. These wires are held at three or four places in their length by light metal rings, which are hinged together, so as to permit of the ready removal of the guard. Another method of protection adopted on the Prussian state railways consists in the use of a jacket of tin plate, which surrounds the tube except for the narrow longitudinal opening in the front. In another arrangement of a somewhat similar character a sheet brass guard is used, and is freely perforated, the holes being diamond shaped and pitched as closely together as due regard for the strength of the envelope will permit. These guards are open to the objection that dust accumulates in the orifices, while it is often difficult to detect the true position of the water level, owing to the limited amount of glass which is visible. The writer is of the opinion that both these defects would be minimized by well bevelling the edges of the perforations. It will be noted that these guards are only capable of preventing articles of glass flying and causing injury to the attendant. They are no protection against the issuing steam and water.

Quite another class of guard is that in which we find shields of plate glass mounted in various ways and arranged so as to protect the gauge glass from draughts or accidental flows, while at the same time forming a tolerably effective protection to the fireman in the event of the gauge tube failing.

In some of these guards the plate glass is half an inch or more in thickness, and generally there are two pieces used, which are sometimes mounted so that the two sheets are at right angles. Generally it will be found preferable, however, to make the included angle one at about 60°. Some indication of the destructive effects which flying pieces of the gauge glass are liable to cause was found in the failure of some of the earlier of these guard plates, the particles of which flew about in all directions and only intensified the danger they were intended to avert. But with the use of toughened glass this difficulty was overcome, and now it is seldom that these guard plates fail to fulfil their intended purpose.

Other types of somewhat similarly arranged guards involve the use of glass jackets which partly surround the gauge tube, and which are attached to a brass back plate, the latter being sometimes enameled in order to better enable the water level to be seen. These guards are easily attached and removed, and possess the cardinal virtue of not distorting the gauge reading in any way. In one recent form a netting of wire is embedded in the glass to further strengthen it.

One other arrangement calls for notice, and in this the ordinary round gauge glass is omitted, being replaced by a strong brass case having a plate glass front, the latter being generally about five-eighths or three-quarters of an inch in thickness. In one form the inner face of the glass front is grooved longitudinally with a series of triangular furrows, which render the water level more distinctly visible. Naturally some amount of care is necessary to form so large a steam and water tight joint, especially with materials having such different expansibilities under heat, and, moreover, it is found that the glass is attacked and rendered brittle, so that it becomes in itself a source of danger if not well looked after. There are a number of other varieties of gauge glass protectors in use, but as most of them are based upon one or other of the forms outlined in the foregoing, no extended reference to these is necessary. Probably sufficient has been said to indicate in some measure the amount of attention which has latterly been directed toward effecting some very necessary improvements in a by no means unimportant boiler fitting.—*Power.*

Blow-Out Pipes on Boilers.

BY W. A. CARLILE.

At first sight it would seem that there was nothing particularly interesting about the blow-out pipe for boilers. There is little variation in the position of the pipe, or in the material of which it is made, and it has only one function, which is to blow water out of the boiler. Having said so much, the subject, to some, might seem to be exhausted. Let us see if it is so.

These pipes in horizontal boilers are as a rule attached to the bottom of the shell, near the front of the boiler. A block is riveted on the shell. The pipe is bolted to this, and at the other end of its bend is the blow-out cock. The arrangement is simple enough, and yet these fittings give a great deal of trouble in many cases.

The most obvious of these are leaks, which lead to corrosion on the shell externally. These leaks are evidently caused by straining of the pipe as the boiler expands and contracts. Were the pipe free it would move with the boiler, but in many cases it is not easy to give it the requisite freedom of movement. Where its waste pipe passes to the drain through an opening in the bottom or side of the blow-out pit, the pipe, even if originally left free in the hole, is liable to become bound by the accumulation of dirt, or fragments of coal or brick dust around it. If the pipe cannot be altered, then attention to keeping it clean is the only remedy.

With a range of boilers the blow-out pipes will sometimes all be attached to a horizontal pipe, which runs along the length of the range. This arrangement, being a convenient one, is often adopted, and if the horizontal pipe is free at the ends it would seem to be an excellent plan to have a floating pipe, free to come and go. If all the boilers could always be kept at the same temperature there would be no great drawback to this method. But apart from the fact that there is continual variation in temperature and expansion, we must remember that some of the boilers are often at rest when others are at work. Say one boiler is cold, and one on each side of it is under steam. In that case a bending strain is thrown upon the horizontal pipe, and its resistance to this causes the joints of attachment to the boiler to strain and leak when steam is next raised in that boiler. The hot boilers are also strained at the same time. With a boiler at work and one on each side of it at rest, the result is almost the same. In the case of the cold boiler the pipe is under tensile strain, and the joint is likely to open at the back. With the boiler hot, the strain is compressive, and the tendency is to cause a leak at the front of the joint.

To avoid this straining, the waste pipe of each boiler in a range is sometimes led straight away from the boiler, through the brickwork beneath the floor plates, with the end of the pipe free and opening into a drain. But if the pipe is long its own weight acts as a drag, and this has been known to cause straining. The best arrangement seems to be that in which the waste pipe is short and is passed loosely through the opening of a larger pipe which leads to the drain.

The straining of these pipes does not end with leakage, for leakage means corrosion. Serious accidents have occurred through corrosion on a cast iron blow-out bend, leading to violent rupture. The danger of a fractured blow-out pipe is very great to the fireman, and fatal results have followed, but it is more far-reaching than this. A pipe breaks. There is a rush of boiling water and a cloud of scalding steam. Everybody gets out of the way. Even if an attempt is made to draw the fires, such drawing may be impossible, on account of the out-rushing water and steam. The fires are in full blast, and if they cannot be drawn there may be a collapse of the furnace crowns, and an explosion of the boiler that may wreck the building. Therefore, though these pipes may be out of sight, beneath the floor plates, they cannotsafely be left "out of mind" as well.

One of the worst methods used with these pipes is to build the cross wall straight across, so that the pipe passes through it. This sometimes causes the pipe to "bind," and the rigidity being so close to the bend any relief by molecular yielding to the strain is largely reduced. But a more serious matter is that the joint is hidden, so that if the joint leaks it is not seen, and corrosion may become very deep before it is discovered. Again, a leak from the joint, which might drop clear of the pipe, which in ordinary circumstances could not cause corrosion, may cause corrosion in this case. The damp is absorbed by the brickwork of the cross wall, and by capillary attraction passes to the pipe, where it goes through the wall. Not only do the bricks conceal this, but they hold the wet close to the pipe, so that cases have been known of deep corrosion taking place at the part of the pipe that passes through the brickwork.

To avoid this the wall is usually recessed, so that when the floor plate is lifted the whole pipe can be seen. But there are cases where the wall has been properly recessed and where another wall has been built across in addition. This incloses part of the pipe in a closed chamber, which is unseen by the attendant. Such building across is resorted to for the purpose of keeping ashes, &c., out of the recess, but its effect is about as bad as if there was no recess at all.

So far we have been dealing with effects external to the boiler, but if we look inside when the boiler is at rest we shall find that corrosion on the blow-out plate is very common. The reason at first is not quite clear. It seems as if the mud in the boiler had a more corrosive action on this plate than elsewhere. As boilers are usually set at a slight slope downward to the front, there should be more mud here, and also more corrosion, if the mud concentrates the corrosive action. But, on the other hand, when a boiler is opened, but not yet cleaned, it will be found that mud is all along the bottom as well as on the blow-out plate. Therefore there ought to be a good deal of wasting along the bottom, if the blow-out plate is severely corroded. As a rule this is not found to be the case, and frequently there is no corrosion at all along the bottom, and a great deal on the blow-out plate. We must therefore look for some other cause than the corrosive action of the deposit.

That cause appears to be in the straining of the plate by the blow-out pipe. In one range of boilers there was frequent renewal of this plate in one or other of the boilers, owing to rapid corrosion going on. The waste pipes were made more free, as an experiment, and there was a marked diminution of the corrosion.

The connection between straining and corrosion seems to be this: Under a strain microscopic cracks are found, and upon the bright surface of these any acidity in the water rapidly acts. Then there are more cracks and more corrosion, and the thinner the plate gets the more rapid is the action. An analogous case is that of a chain, where a weak link will stretch more than a strong one. Thus, with a plate, a weak part will yield more to stress than if it were stronger, and the corrosion acts with more and more power as the plate thins.

There are, however, instances to the contrary, or that in which a blow-out plate will corrode to a certain point and the corrosion then be arrested. In such a case there may be a difference in the incidence of the strain, and a thinner plate may have the advantage. If the strain should be a bending one, owing to some peculiarity in the setting, a thin plate would not be so ready to crack on its surface as a thicker one. Then, as it got thinner, a point might be reached where it would not crack at all, and the corrosion would then cease. Such an explanation may, to practical men, seem to be theoretical. It is, however, better than no attempt at all at an explanation.

The relation between straining and corrosion is, however, an obscure one, and if the present article should lead others to turn their attention to the elucidation of the problems presented, the purpose of the article will be served.—*Machinery.*

Personals.

George W. Russell, of the Russell Paper Company, and Mrs. Russell have been at the Lakewood Hotel, Lakewood, N. J., for about two weeks.

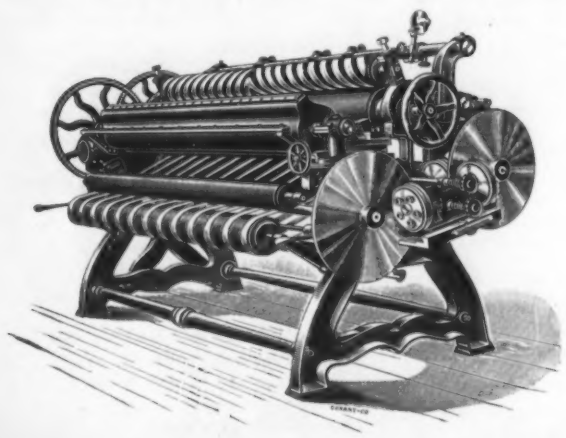
W. E. Lathrop and Mrs. Lathrop returned last Monday from a sojourn at the Lakewood Hotel, Lakewood, N. J.

Robert Highet, of Benedict & Highet, and Mrs. Highet have been visiting at the Lakewood Hotel, Lakewood, N. J.

C. O. Wood, the representative of the L. L. Brown Paper Company, who hails from Columbus, Ohio, was in town this week.

In Town.

Russell Jarvis, West Claremont, N. H; John H. Hall, Lambertville, N. J.; C. H Southworth, South Hadley Falls, Mass. G. C. Sherman and A. D. Remington, Watertown, N. Y.; E. McCready, Catawissa, Pa.; G. B. Rommell, Pittston, Pa.; A. W. Eaton, Lee, Mass.; W. O. Russell, Lawrence, Mass.; H. M. Whitney and F. C. Arnold, Boston, Mass.



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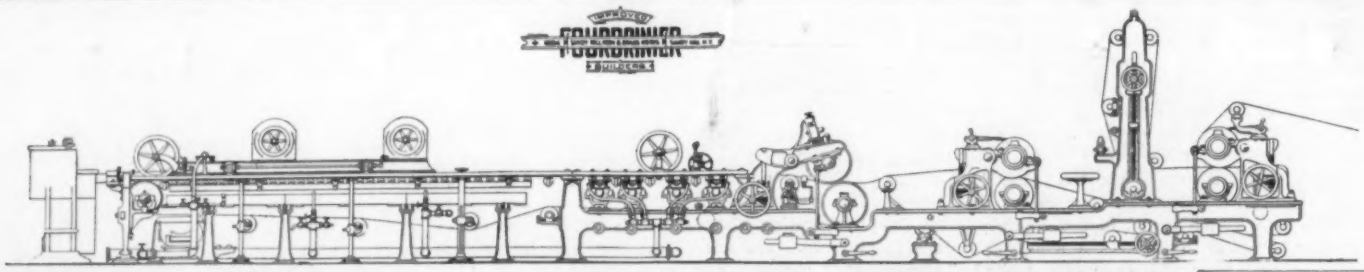

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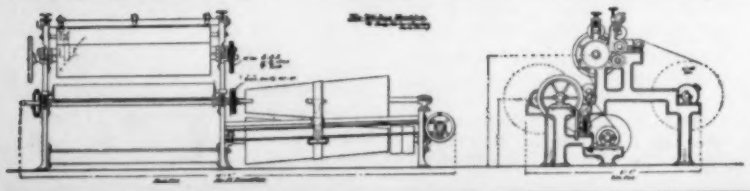

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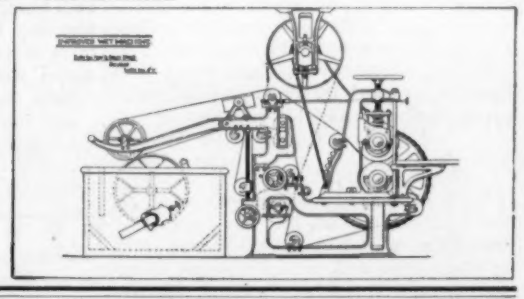

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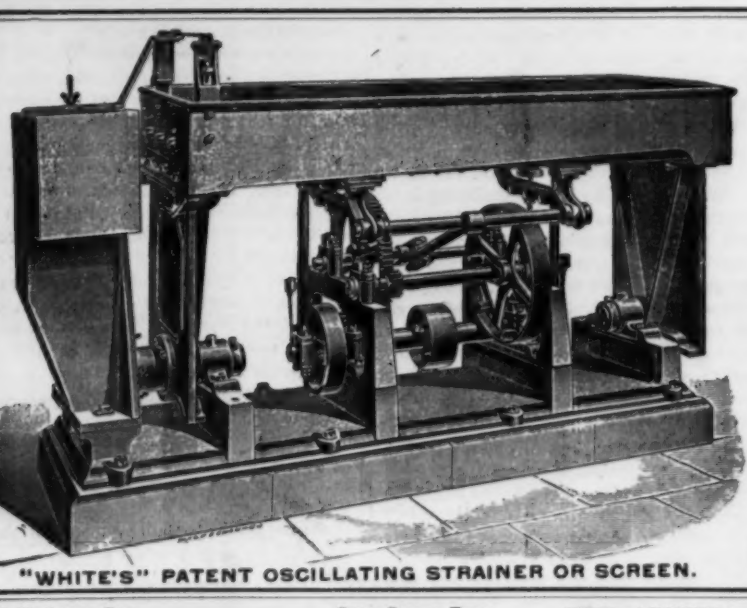

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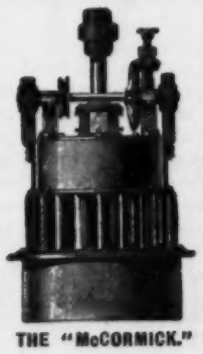

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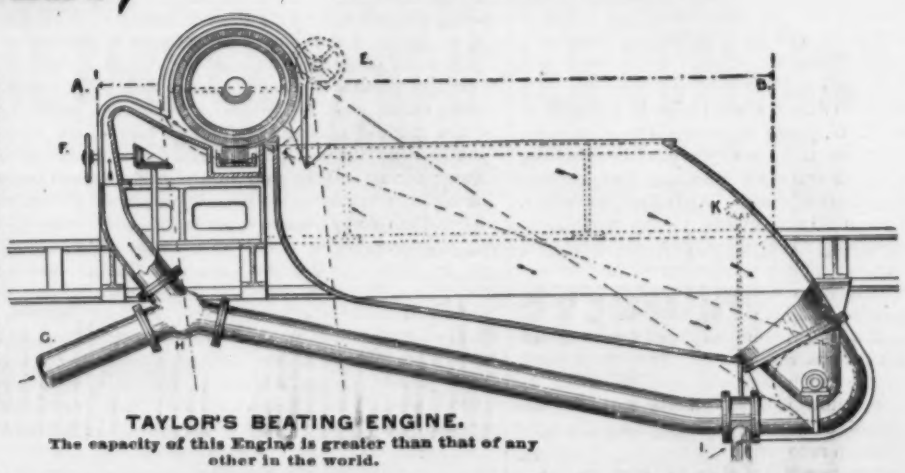

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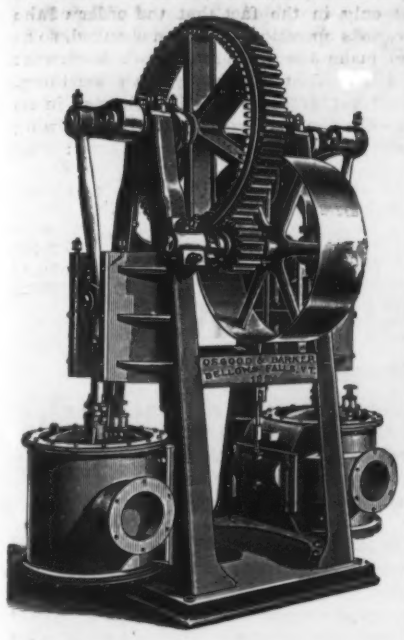

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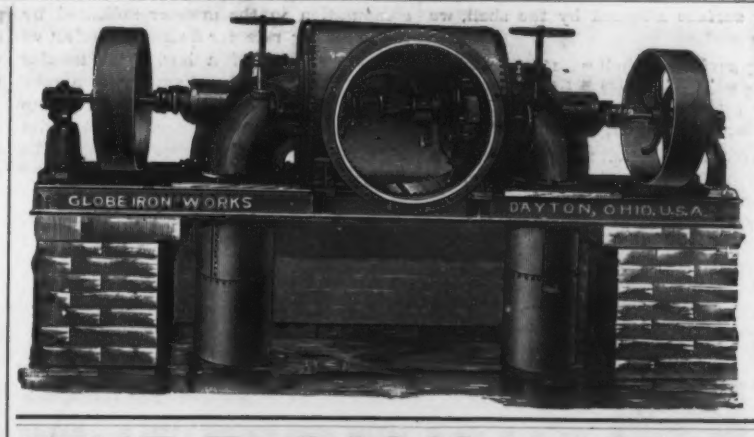

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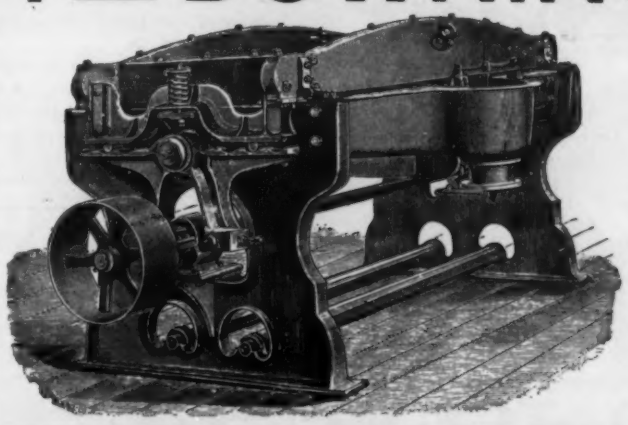

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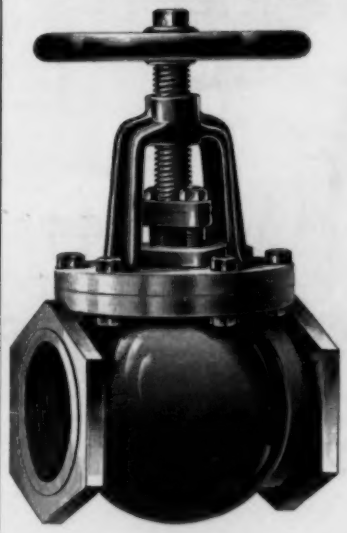

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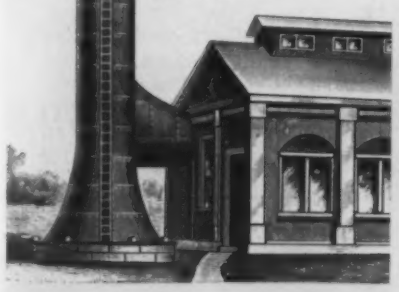

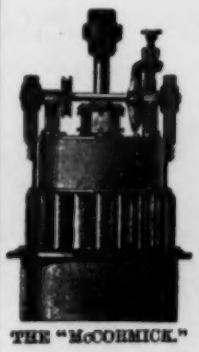

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Horse Power of Boilers.

The expression "horse power of a boiler," although frequently used in engineering practice, is highly unsatisfactory on account of its indeterminateness. No one can calculate what actual horse power can be realized from a boiler without knowing what sort of an engine is to be used; for a boiler which gives 50 horse power with a small, non-condensing, slide-valve engine may give four or five times as much power when used in connection with an engine of more improved design. Nevertheless, the expression "horse power" has become a trade term, and custom has given to it a nominal meaning, which was first definitely fixed by the Centennial Commission. After a careful discussion the commission concluded that with the engines then commonly in use it was possible, in average good practice, to realize an actual horse power from 30 pounds of steam per hour, the pressure being 70 pounds, and the temperature of the feed water 100° Fahr. This definition of the phrase "horse power," as applied to boilers, has met with almost universal acceptance among boiler makers and designers, so that when an order is given for a boiler of a stated number of "nominal horse power" it is understood (in the absence of any agreement to the contrary) that a "horse power" means the evaporation of 30 pounds of water per hour, under the conditions stated above.

In computing the horse power of a boiler by the Centennial rule, or by any other rule, the first problem is to find the heating surface of the proposed boiler, which consists of all those parts of the shell, heads, and tubes which are exposed to the direct action of the fire or of the hot gases that come from it. We shall proceed to consider these parts in detail.

The part of the shell which is exposed to the fire extends from the back head to the rear surface of the front wall of the setting; and it is limited at the top by the side-walls, where they extend inward and touch the boiler. To obtain this area with precision, we should know the exact length of the exposed area, and also the height of the side walls of the furnace; but in practice it is usually assumed that the exposed area is equal to one-half of the area of the entire shell (omitting the dry sheet, of course, in case there is one). This simplifies the calculation very much, and yet the results correspond quite closely to the actual facts. The front head of the boiler is of little or no value as a heating surface, because, if the boiler is well designed, the temperature in the uptake does not greatly exceed the temperature of the boiler itself, and hence there cannot be any considerable absorption of heat through the front head. This head should therefore be entirely omitted in the calculation. The back head is more directly exposed to the heat of the furnace, and allowance is sometimes made for such heating surface as it contains. In our own practice we do not make allowance for the back head, however, because the only part of its surface which is available, in any case, consists in the small segments which lie between the tubes, together with a narrow strip around the flange and just under the back arch. While there might be some heating value to these parts when the boiler is new, we do not consider that they are worth taking into account after it has been used for a time, because scale is likely to form upon them; and even though the scale were not heavy enough to produce overheating, and consequent injury to the boiler, it might yet be quite sufficient to destroy the efficiency of the head, when considered as a heating surface.

The tubes are of great importance in computing the heating surface, because their combined area is very large, as can be seen in the numerical example that we give below. In computing the heating surface of the tube we have first to consider whether we should take the internal or external surface, as the effective one. This question admits of discussion, and could only be settled definitely by actual measurement of the external and internal temperatures of the tube, when the boiler is in operation. If it were found, by experiments of this sort, that the tube, as a whole, is nearly as hot as the gases within it, then the external surface should be taken; while if the tube were proved to be hardly hotter than the water in the boiler, there can be no doubt that the internal surface should be taken as the effective one. We do not know that any such measurements have been made; and, in the absence of them, some engineers base the calculated heating surface upon the internal diameter, while others use the external diameter, and still others the average of the two. Our own practice has been to take the external diameter; and we believe that this course is justified by experience.

This point being settled, the next step is to find the area of the tube, by multiplying its outside circumference by its length—the circumference being found by multiplying the outside diameter by 3.1416. (The diameter of the tube is usually given in inches; so that if the surface is required in square feet it is necessary to divide the given diameter (or circumference) of the tube by 12, so that it may be expressed as a fraction of a foot). The area of one tube being thus found, we multiply it by the number of tubes, and thus find the united surface of all of them. This, when added to the heating surface afforded by the shell, gives the entire surface upon which the rated horse power of the boiler is to be based.

A numerical example will make the rule plainer. Thus let it be required to find the heating surface of a 72 inch boiler, 18 feet long from head to head, with 92 tubes, each 3½ inches in diameter. The diameter of the boiler being 72 inches, its circumference is $72 \times 3.1416 = 226.1952$ inches. To express the circumference in feet we divide this result by 12; thus $226.1952 \div 12 = 18.8496$ feet. The length of the boiler, between heads, being 18 feet, the total area of the shell is $18 \times 18.8496 = 339.2928$ square feet; and $339.2928 \div 2 = 169.6464$ square feet, which is to be taken as the effective heating surface afforded by the shell. Passing now to the tubes, we find that the circumference of a 3½ inch tube is $3.5 \times 3.1416 = 10.9956$ inches, which is equal to 0.9163 of a foot (since $10.9956 \div 12 = 0.9163$). The surface of the tube is then found by multiplying the circumference by the length; thus $0.9163 \times 18 = 16.4934$ square feet, which is the area of a single tube. The combined area of the 92 tubes that the boiler contains is therefore $92 \times 16.4934 = 1,517.3928$ square feet, which is the heating surface afforded by the tubes. Upon adding this to the heating surface afforded by the shell, we have

Heating surface of shell = 169.6464 sq. ft.
" " " tubes = 1,517.3928 "
Total effective heating surface of boiler, = 1,687.0392 sq. ft.

or, in round numbers, 1,687 square feet. (It will be seen that the tubes are of far more importance than the shell, as has been already said above.)

The foregoing method of calculating the heating surface of a boiler may be somewhat simplified by arranging the computation in the manner indicated by the following rule for finding the effective heating surface of a horizontal tubular boiler: Multiply the diameter of a tube (in inches) by the number of tubes, and to the product add the radius of the boiler (also expressed in inches). Multiply the sum by the length of the boiler, from head to head (expressed in feet) and then multiply again by the decimal 0.2618. The result is the effective heating surface of the boiler, in square feet.

This rule is the exact equivalent of the process explained above, and differs from it only in the fact that the order of the various operations has been changed, so as to make the numerical work somewhat easier. That it is really the same thing, and yet at the same time simpler in its application, is shown by the following solution of the problem given above:

(Diameter of tube) × (No. of tubes) . . . = 3.5 × 92 = 322
Radius of boiler (in inches) . . . = 36
Sum . . . = 358

Then, the length of the boiler being 18

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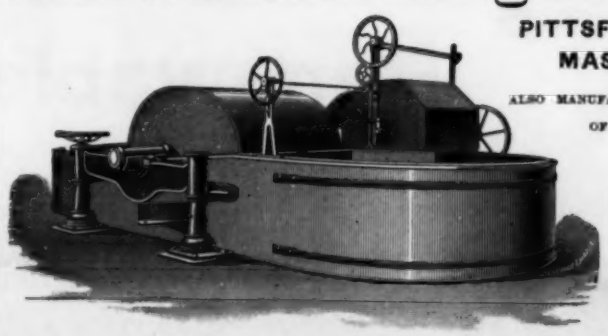

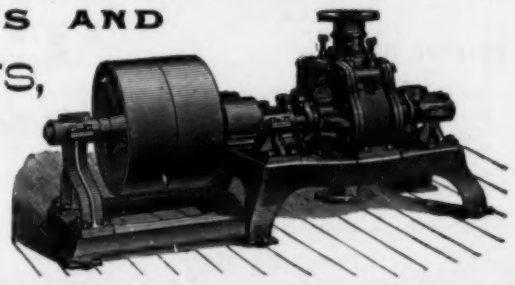

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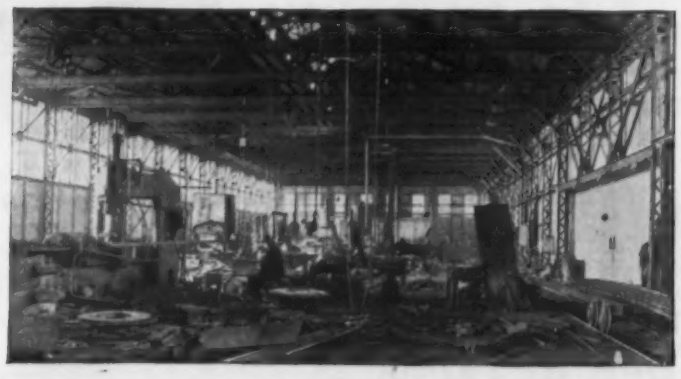

THE above illustration was taken direct from a photograph, and shows the interior of a new Forge Shop Building designed and built for our own use at East Berlin, Conn. The building is 60 feet in width, 300 feet in length and constructed entirely of iron and glass, no woodwork except window sash being used in the construction. The roof is covered with our Patent Anti-Condensation Corrugated Iron, and the building is lighted by high side lights and ventilator skylight. The interior of the building is ventilated by one of our improved ventilators, extending the whole length of the building, with iron shutters on the sides, opening and closing with cords from the floor. We believe this to be the most complete and perfect forge shop ever constructed and invite examination.

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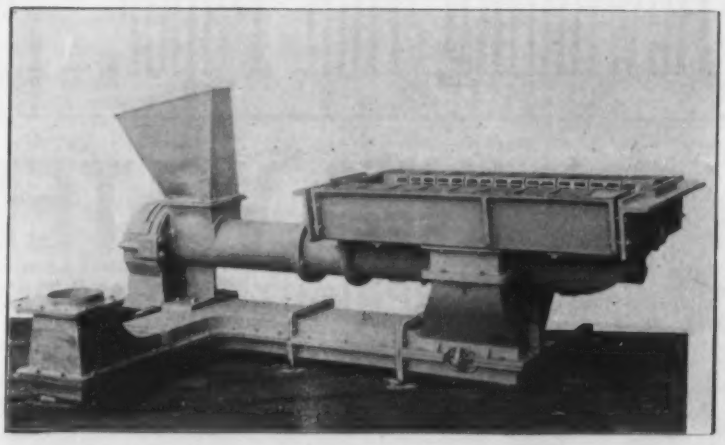

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feet, we have 358 × 18 = 6,444 ; and, finally, 6,444 × 0.2618 = 1,687.0392 square feet, which is identical with the results already obtained.

The heating surface of the boiler being known, the next step is to find what evaporative duty may be expected of the boiler in ordinary good practice. To solve this part of the problem we have to know from experiment what amount of water can be economically evaporated by each square foot of heating surface per hour. The Centennial Commission considered that 2 pounds was a fair estimate. In our own practice we find that when the boiler is well designed, and the draught is good, an evaporation of 2½ pounds of water per hour may be had from each square foot of heating surface. In exceptional cases the evaporation may run as high as 3 pounds; but under ordinary circumstances it is found that 2½ pounds is all that can reasonably be expected. Accepting the estimate of the Centennial Commission of 2 pounds per square foot per hour, it follows that 15 square feet of heating surface will be required for each "nominal horse power" of the boiler; for at 2 pounds per square foot the evaporation on 15 square feet will be 30 pounds per hour, which is the amount of steam required in the commission's definition of the "horse power." The nominal horse power of a boiler would therefore be found by dividing the heating surface (in square feet) by 15. If the data afforded by our own experience be accepted, it follows that the boiler will have one nominal horse power for every 12 square feet of heating surface; for if each square foot evaporates 2½ pounds per hour the total evaporation on 12 square feet will be 12 × 2½ = 3 pounds per hour. Hence, in our practice we calculate the nominal horse power of a boiler by dividing the total effective surface (in square feet) by 12.

If it is desired to calculate the actual horse power that a given boiler may be expected to furnish, we must first know something about the engine that is to be used. For the boiler merely produces the steam, and it is the engine which transforms the heat energy of the steam into mechanical energy; so that if the engine is efficient a large yield of mechanical energy may be expected; while if it is wasteful the yield of mechanical energy will be much smaller, even when the boiler is worked just as hard as before. The duty of a given engine can usually be pretty closely estimated by a person who is familiar with the performance of other engines of the same type; and, in fact, large engines are often built by contract to run with a given steam consumption per horse power per hour. If the duty (or steam consumption) of the engine is known the actual horse power that may reasonably be expected from the boiler can be calculated by the following rule for finding the actual horse power :

First find the heating surface (in square feet) as before. Multiply this by 2½, which will give the number of pounds of steam that the boiler can produce per hour. The evaporation thus found is then to be divided by the weight of steam required by the engine that is to be used, per horse power per hour, and the quotient is the actual horse power that may reasonably be expected when the proposed boiler and engine are run together under favorable conditions.

In conclusion, we shall give a numerical example illustrating the application of this rule, taking for this purpose the boiler whose heating surface has already been computed. The heating surface being 1,687 square feet, the evaporative duty of the boiler per hour will be 1,687 × 2½ = 4,217.5 pounds.

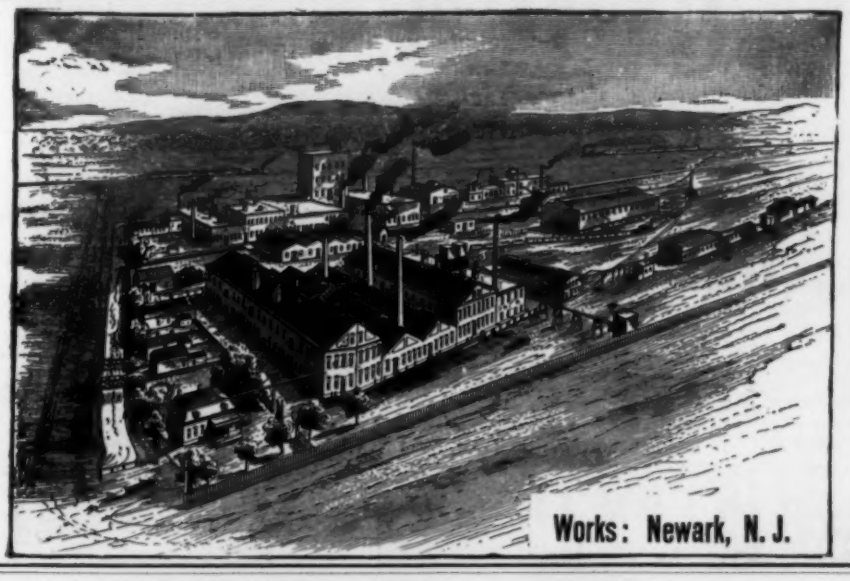
We will assume, first, that the engine is of the ordinary single cylinder, non-condensing form, and that it uses 30 pounds of water per horse power per hour (which is the duty assumed by the Centennial Commission). The actual horse power developed under such circumstances is then 4,217.5 ÷ 30 = 140 horse power.

On the other hand, if the engine were of the triple expansion, condensing form, with a steam consumption of (say) 12.5 pounds per horse power, the rule would give 4,217.5 ÷ 12.5 = 337.4 horse power, which is the actual yield of mechanical energy that could reasonably be expected with this engine and boiler.—*Locomotive.*

Attaching Thermometers.

The proper method of attaching hot water thermometers is not clear to a great many. In frequent cases the thermometer is screwed into nipples, and at the end of long pipes, where its bulb cannot come into contact with the circulating water, and the result is the readings are not satisfactory. It is absolutely necessary that the thermometer should be so placed that the bulb will always be in direct contact with the circulating water. This will give the best results.

In case of fire in the engine room or near it, the main belt should be taken off and removed to a place of safety. Some engineers always keep a sharp knife handy for this purpose. In few cases can more dollars be saved in a short time than by doing this. Do not lose your presence of mind, however, and cut the belt close to the lacing, but if possible cut it where it will do the least damage—that is, through the lacing.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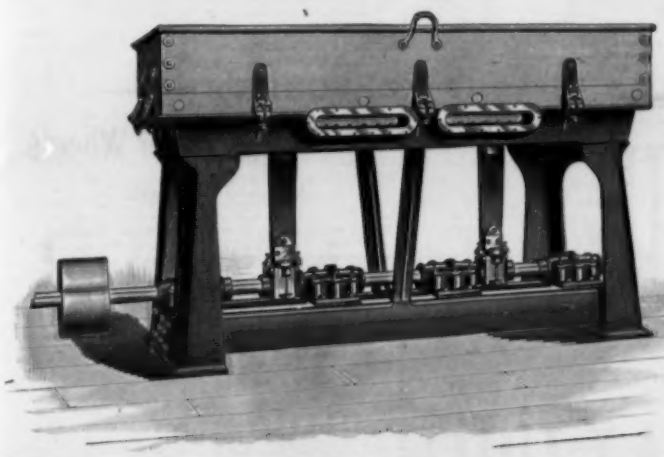

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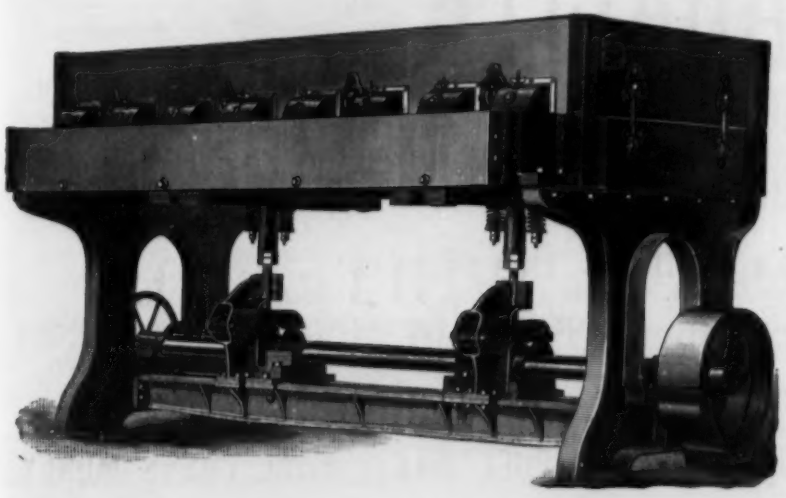

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Many owners of steam plants are in the habit of thinking that a machine possesses all the intelligence of a man and can readily adapt itself to any or all conditions, no matter how wide the range may be.

They seem to forget that there are certain laws in mechanics which will not admit of deviation from them without injuring, if not completely destroying, the usefulness of any plant intended to be used in accordance with them.

There are many machines which will do work with an accuracy that man cannot, and yet these machines have not the power to carry more than a given load, and cannot speak out and say so to ears not familiar with their language, consequently they simply try to perform the imposed duty until they are too heavily handicapped, when they come to a stop, as strained or broken.

Pressure regulators are no exception to the rule, and when you find one that is rightly constructed acting badly you may be sure that the trouble is not in the machine, but in outside conditions.

The amount of ignorance as just how to use steam appliances is astonishing when one stops to think, and the need of study is more and more apparent every day.

This thought was illustrated a few months ago in a large manufacturing establishment, where a new pressure regulator or reducing valve had recently been put in. The engineer in charge sent word to the maker of the valve to come and remove it.

On going to the place the valve was found reducing a pressure of 90 pounds to 10 pounds with the greatest accuracy.

"What 's the matter with the valve?" was the query.

"I don't know," replied the engineer.

"Isn't it working all right?"

"Yes, it is now."

"Well, see if you can make it go wrong," was the next suggestion; which was tried without the slightest effect.

The valve man was staggered for a moment as to just what to do, when a thought came to him, and looking up he asked the engineer, "What does it do when it works bad, any way?"

The engineer hesitated for a moment, and then said, "Well, it makes the boiler foam."

The valve man did not faint, but his face carried an expression of pity for the engineer who thought that a valve which reduced the amount of steam drawn from a boiler could possibly be responsible for its foaming, and yet he was condemning the valve on that account pure and simple.

There are several things which should be known before buying a pressure regulator or reducing valve, and one of them is, Do you need one?

To commence with, What is a reducing valve and what is its use?

A reducing valve is intended to take steam at any reduced pressure from a boiler and reduce it to a certain pressure before it enters the series of pipes to which it is attached.

There are many advantages in doing this, especially in these days of high boiler pressures; for instance, take a boiler carrying, say, 125 pounds pressure, part of which steam is used for heating. In order to maintain this pressure throughout the heating system would require much better pipe, fitting and workmanship than a lower pressure, and to maintain that pressure for heating would be far from as economical in many ways as one-fifth the pressure would.

Then, again, supposing we have boilers furnishing steam for a triple expansion engine requiring a pressure of 150 pounds per square inch, and wish to draw steam from the same boilers for engines not calculated at best for over 80 pounds pressure; by not reducing the pressure we not only have poor economy, but an element of danger which should not be disregarded.

There are many other ways in which a reducing valve pays for itself in an incredibly short time, but its usefulness depends wholly upon conditions of a plant and its needs.

It is the height of foolishness to put a reducing valve on a system where the full pressure is insufficient to furnish the proper amount of steam, and yet many engineers will advocate it. It is equally bad judgment to put a reducing valve in a pipe where the steam is wire drawn, by reason of the pipe being too small. Yet this is frequently done, and then fault found with the poor lone reducing valve.

One has little conception how steam in use flowing through a pipe reduces in pressure with distance. An interesting experiment may be made by placing gauges at various distances along the pipe and noting the varying pressures. One of the best comparisons may be made by taking a bamboo pole, say 20 feet in length, and, fastening one end in a vise, bend the tip toward the floor. The bend will hardly be noticeable for a few feet from the vise, but as we near the tip the distance between the pole and the floor diminishes rapidly until the tip touches it. So with the pressure in a steam pipe, especially where it is small and the pressure light; at first the decrease in pressure is hardly noticeable, but as the distance from the supply increases the pressure rapidly decreases, until there is little or no pressure left.

That many engineers do not appreciate this is shown by many systems of piping for live steam, say, for instance, in dye houses and similar places. You not infrequently see, say, a 2 inch pipe running over a number of tubs, each of which is drawing steam through an inch leader from that 2 inch main, and yet the operatives wonder that some of the tubs do not boil as they should.

There are many plants which are fitted up in just the same way for heating; in other words, with mains utterly inadequate to supply the coils.

Then, again, the steam is too often wire drawn by crooks and bends in a pipe, which, of course, increases the friction, so one thing to be considered is, Do you need a reducing valve?

If your pipes, for any reason, fail to carry the desired amount of steam to the end of the system, and give the right pressure there, then you do not need a reducing valve, but you do need a larger pipe.

If the desired pressure is maintained, and the subject of a reducing valve comes up, the question to be considered is, would the pipes be adequate to transmit the required amount of steam were the pressure at the inlet reduced any material amount; say, for instance, if 90 pounds pressure is adequate for the system would the pipes supply steam enough with 10 pounds pressure at the inlet? If so, then a reducing valve should certainly be put in, and an extensive saving of coal would result. If not, then the putting in of a reducing valve would be simply folly.

If the conditions are made known to any reputable dealer in reducing valves he will tell to a certainty what his valve will do, and be in a position to state whether it work satisfactorily or not. But unfortunately this plan is not followed to any great extent. The steam user writes for a reducing valve of a given size, and then if it does not work under all sorts of conditions he condemns the valve.

This imposes an unfair hardship upon the valve maker, puts him to needless trouble and expense, which a little forethought might save.

This can all be avoided by having the engineer of a plant give a general idea of the piping and the work which a valve is expected to do, for no manufacturer would send a valve guaranteed to work in a place where he knows that the conditions will not permit of at least a fair chance.—*Textile World.*

Large rivets in a riveted joint in a steam boiler make the joint stronger so far as the rivets are concerned, but make the plate weaker unless the pitch is increased according to the size of the rivet.

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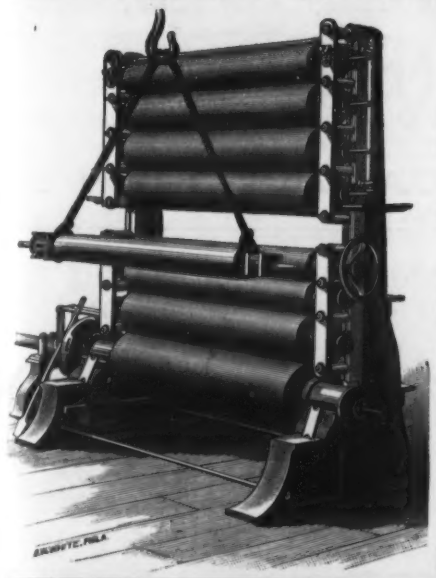

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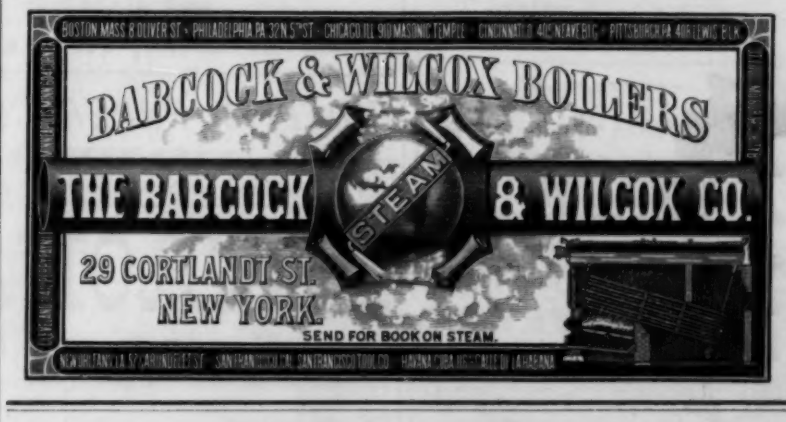
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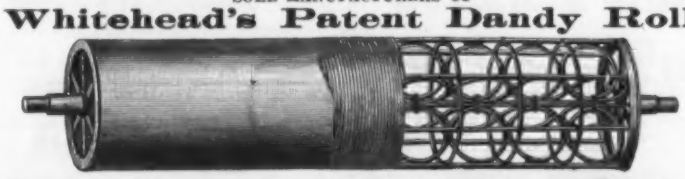

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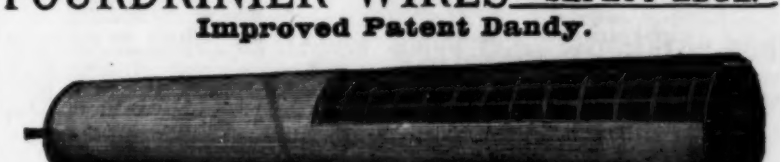

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